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Association of Professional Engineers

Province of Ontario

ATTENTION OF ENGINEERING STUDENTS

THE ASSOCIATION of Professional Engineers of the Province of Ontario is constituted by the Legislature of the Province of Ontario to govern the practice of professional engineering in this Province. In brief, no person is permitted to practice professional engineering or term himself an "engineer" (with certain exemptions as defined in the Act) unless he is a registered Member or Licensee of the Association.

Registration can be obtained by graduates of the faculty of Applied Science and Engineering, University of Toronto, holding the Degree of Bachelor of Applied Science in Engineering, as soon as they are able to submit evidence of satisfactory practical experience.

Provision is made in the Act that an undergraduate may be recorded with the Association while attending University, thereafter, submitting annually information as to his standing and additional engineering experience. When he has acquired the necessary practical experience, he may then apply for final rgistration, which gives him the right to call himself a Professional Engineer and to practise Professional Engineering. With the exception of persons exempted from the operation of the Act no one may use the title, "Professional Engineer" or "Engineer," or any title similar thereto unless he is a Member or Licensee of the Association.

A recorded undergraduate receives the publications of the Association and all reports and information that is distributed to members. He receives a card that may serve as an introduction to prospective employers.

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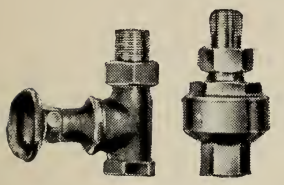

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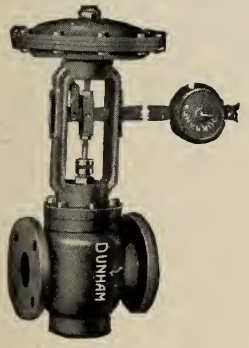

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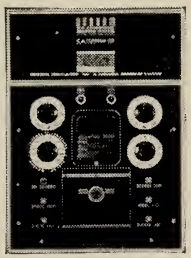

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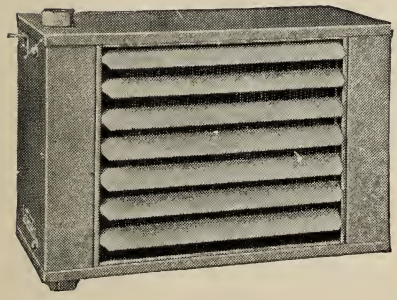

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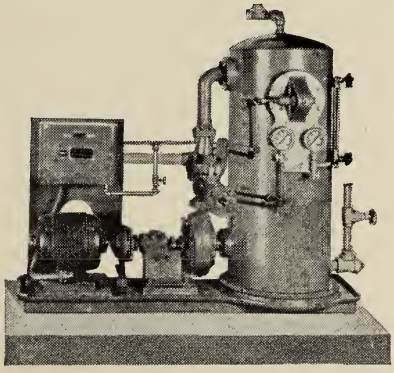

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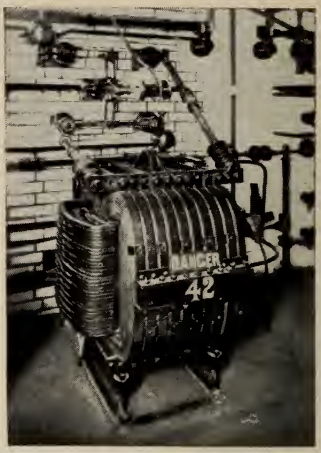

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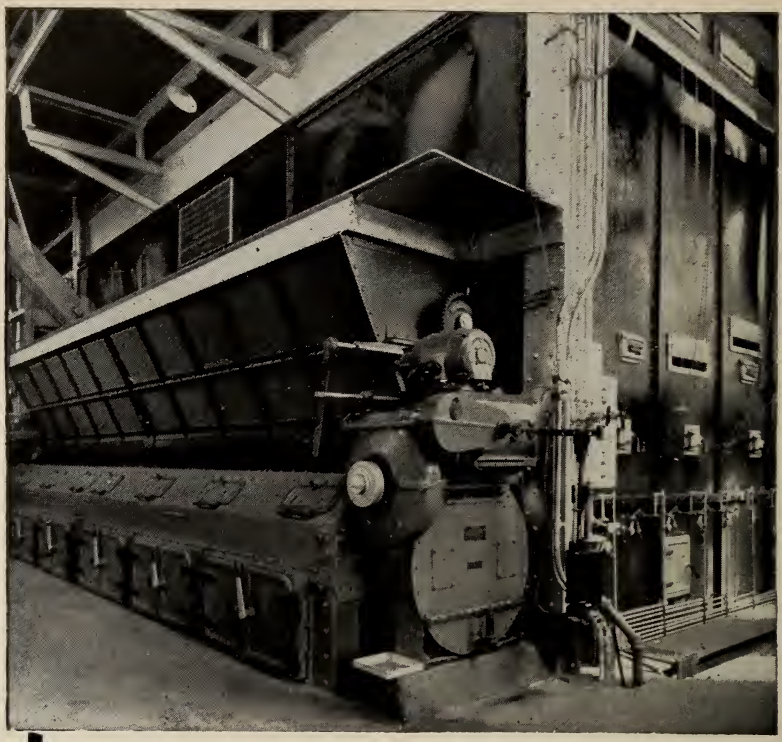

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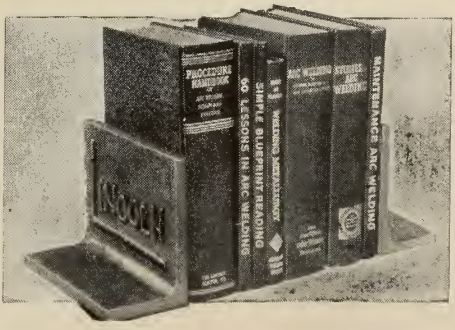

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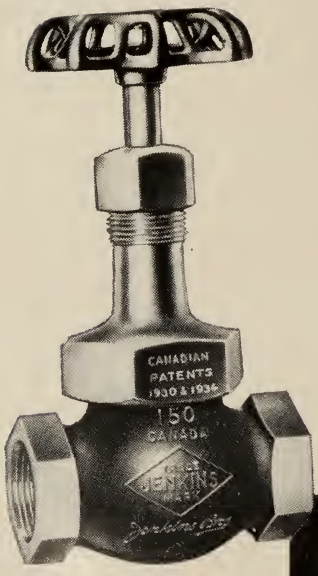

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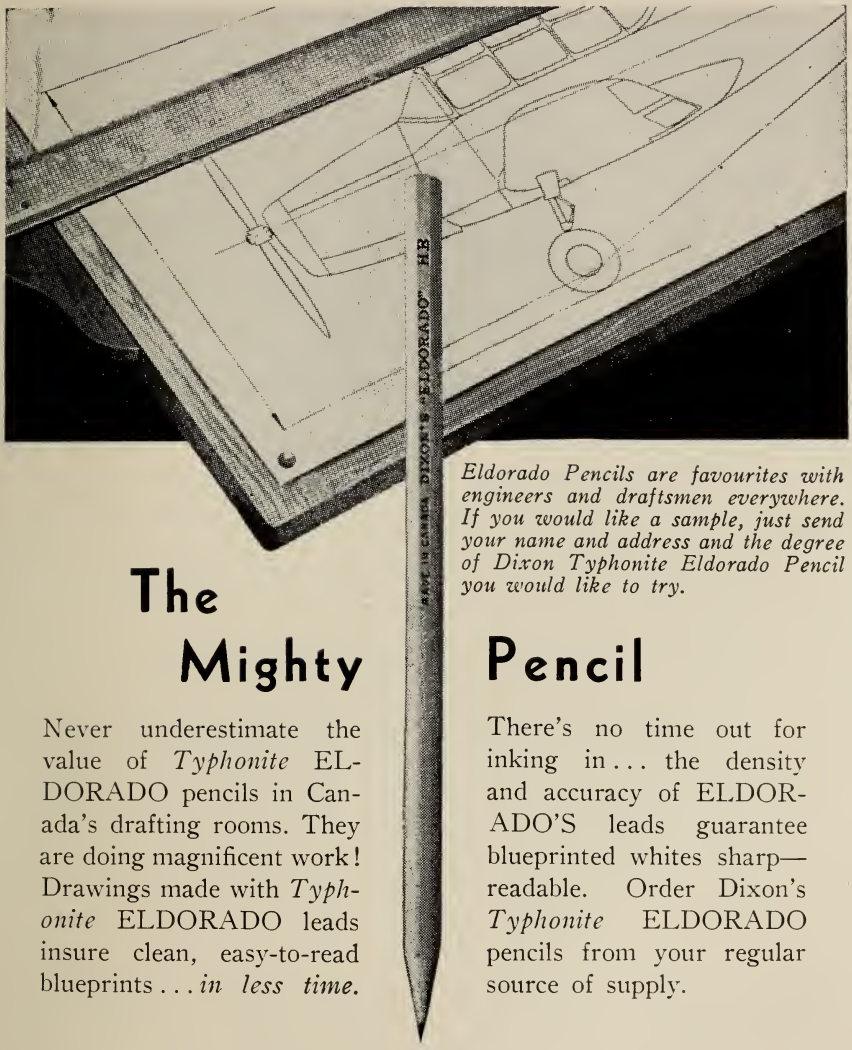

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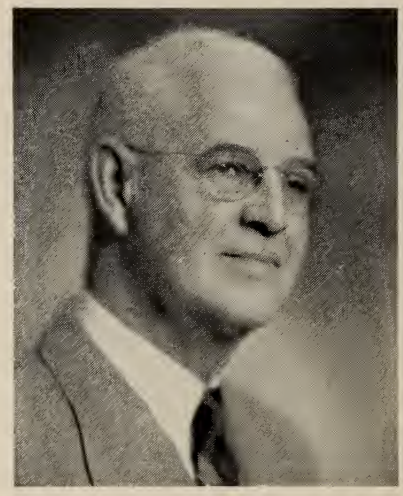

Professor John James Spence

A MOST kindly, unassuming, friendly member of the staff disappeared from among us with the sudden death on the thirtieth of October of Professor John James Spence.

Professor Spence entered the University from Upper Canada College and graduated with the class of nought-nine in mechanical and electrical engineering. After some years spent in practice, he returned to the University in nineteen twenty-five to become a member of the staff in engineering drawing. He will be remembered with affection by many students for his work in the second year drafting room. No task for a student or a colleague was ever any trouble for him and he sought every opportunity to serve us all.

Professor Spence belonged to Zeta Psi Fraternity and the Ontario Association of Professional Engineers. He also belonged to the Engineering Institute of Canada and served with distinction for some years as secretary of the Toronto Branch.

We all mourn the loss of true friend, helpful associate and teacher, and extend to Mrs. Spence our sincere sympathy.

TRANSACTIONS STAFF

Left to Right: R. R. Galpin; K. E. Hunter; G. R. Muddiman
M. C. Ryan; L. Maxmonko

Inset: H. Blakely

TRANSACTIONS and YEAR BOOK

of the

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No. 62 APRIL, 1948

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Applied Science and the University

An Editorial

THERE has been much discussion recently about the aims and functions of the University. The main idea set forth is that a university exists for the purpose of cultivating the intellect with no application itself. This end it is claimed can be attained only through the study of the liberal arts.

By this definition it is apparent that the greater portion of the present university courses are interlopers, and in particular those courses now given in applied science. It is pertinent therefore to examine these claims on the part of the proponents of the humanistic studies with a view to testing their validity.

Suppose we saw a man assiduously tilling a field in time of famine. If we were told that he tilled only for the sake of ploughing and harrowing we should rightly judge him to be a useless burden on society. There is an obvious parallel here to the demand that the intellect should be developed for its own sake alone. Withdrawal from life into a university to develop the intellect is significant only if the increased mental ability and learning is returned to the world to be used in solving the problems common to mankind. This conception of the university is surely preferable to one restricting it to a small cult of knowledge grubbers.

It has long been recognized that the study of natural science is one of the finest disciplines that can be offered for training the mind and the mind is developed quite as effectively by studying the sciences with a view to applying them to everyday problems as by studying them purely for their own sake. This is not to imply that the humanities have not an important part in education. However these studies form only a *part* of a well rounded education.

For men must, by their nature, live in a society. Their education must fit them to tackle the social, economic and spiritual problems continually arising in a society.

In our society today natural science, both pure and applied, has become such a tremendous force and has raised questions so fundamental that no man, however well versed in literature and philosophy, can play his full part without some understanding of scientific thought. One may sincerely question whether an education ignoring the whole edifice of natural philosophy can in any sense be called a liberal education.

Dr. Sidney E. Smith

To the Graduates

THROUGH the courtesy of the Editor-in-Chief of the sixty-second edition of the Transactions and Year Book, I extend to the graduates of 4T8 congratulations and best wishes. These sentiments are a blend of regret and pride. In retrospect, we regret your leaving our halls; in prospect, we send you forth with pride.

As we travel down the years since 1886, when the Transactions and Year Book first appeared, we observe the leading roles which graduates of the "Skule" have played in contributing to the amenities of living, to the exploitation of our natural resources, to the expansion of our trade, to the development of our industries, and to the building of our nation. To point to the records of those graduates would be in itself a challenging and inspiring message to you.

William Beard, in his book, "Government and Technology", written in 1934, sounded a prophetic note when he stated:

> The functions of industrial society and government are so largely technological in character that the engineer will, whatever his personal views, occupy a central position in the future; his science will be more and more indispensable to the conduct of government and to the stability of society. . . . But the challenge of the new age to engineers is still open and will long remain open. It is to be hoped that the rising generations of engineers will face that challenge boldly and aptly apply the indispensable instruments of their science—rationality and efficiency—to both government and industry.

President Harvey N. Davis of the Stevens Institute of Technology, in the first Wallberg Lecture delivered on January 27th of this year, reminded us of the growing demand for engineers in managerial work and allied fields. You will hearken to that demand.

The engineer should not fail to dispute the observation made by members of other vocations and professions that they, and they alone, are qualified to deal with social, economic and political affairs. The careers of many of the graduates in Engineering of your University confound that claim, which is at once an accusation against engineers and a boast for themselves.

In view of the economic and political complexities of today, arising out of technological advances, urbanization, vexed industrial relations, new social services and higher standards of living, you must be prepared to leave your laboratory, your mine, your factory or your office and help to solve some of these difficult and urgent problems. You will not be able to use your slide rule for the evaluation of the sentiment and prejudice inherent in many of these public issues. Yet your scientific objectivity is required for refining the irrelevancy of much of our discussion of governmental problems.

By virtue of your education, you will insist on proceeding from established premises to valid conclusions, you will discard meaningless labels and you will endeavour to distinguish truth from error, evidence from opinion and reason from emotion. Our democracy needs your intelligence for the reconciliation of its diversities, your character to promote its unity, and your courage to safeguard its existence.

SIDNEY SMITH

"Thirty"

Amongst editors and those who have to do with the printed word there is a long-standing custom of indicating by the circled number "30" the end of an article or a product of the writer's art. It marks the completion of what the author fondly hopes is a satisfying and profitable performance.

It is to be hoped that those who graduate this year will experience the realization of a like hope. You have worked hard and long, and if the struggle has at times been severe the success that it brings will be the more prized.

You have spent your university years in stirring times. Difficulties and emergencies have on all sides confronted students as well as staff. But in meeting them resolutely and triumphantly you have done much to develop yourselves. There is no time quite so effective in bringing talent and courage to the surface as a time of emergency. As Professor William James has pointed out, there are unsuspected inner reserves of energy upon which men may draw when they are in exacting or

desperate situations. Service men are only too well aware of the significance of this principle, and all enterprising and conscientious students can everywhere testify to its existence.

The years ahead are uncertain but challenging. Men with a sound scientific and technological education will be particularly well fitted to meet them. There is vast physical reconstruction to be undertaken. Still more important is the desperately needed economic restoration of the world. That restoration is a function of production and production is the business of the engineer, who by planned utilization of men, materials, and machines adds to the desirable possessions of mankind. Given political and labour stability he can achieve it.

The contribution of the engineer to the utilization of the materials and energy that lie about him is conditioned upon having an uncluttered stage upon which to play his part. The provision of it is a matter for society as a whole, which alone establishes or tolerates conditions under which men work. As a member, and it is to be hoped a vital member, of society, the engineer can do much to further the constructive labours of all who work for the common good, including himself.

C. R. Young

T. C. W. Little

Engineering Society President's Address

It is difficult to express the emotions that run through my mind as I write this message to the members of the Engineering Society. After four years one cannot help having many memories associated with that most famous of all campus buildings, the Red School House. Close friendships have been formed by all those who have studied together in these halls so full of traditions.

It has been an honour for me to have served you as President during the past year and the pleasure that I have derived from this office can only be imagined by a former president. For this great privilege, I thank you.

S.P.S. this year has been the largest faculty on the campus, and therefore some would gather that its size would tend to weaken our bonds. But on the contrary, I say without fear of contradiction, that our Society is the strongest and soundest undergraduate body on the campus, the envy of all other organizations, with a spirit that will never be surpassed for the phrase "I am a Schoolman", has and always will command admiration and respect.

The problem of welding together the two campi, Ajax and Toronto, was foremost in the minds of the Executive this year. Although a distance of thirty miles does separate us, there has been close co-operation on all activities. This is due in no small way to the efforts of Bill Walker and his very active committee at Ajax.

To help co-ordinate activities this year the executive introduced many changes in and addition to the program of School events. Some of these will perhaps be changed or even eliminated, but many we feel will remain for they tend to keep the Society well in advance of similar campus Organizations.

The first major event of the session was the 58th Annual School Dinner, and again this year it was held at Ajax. General A. G. L. McNaughton was the guest of honour and he spoke about his work on the Atomic Energy Commission. In order to provide a time and place for those present to meet one another, a smoker was held at the Rouge Hills Golf Club immediately following the Dinner. The success of this added feature was greater than we had anticipated and so will probably be incorporated in future Dinners.

Under the able leadership of Bill MacDonald and his hard working committee, the best School-At-Home of them all was presented soon after the New Year, at the Royal York Hotel. Music for dancing was provided by Johnny Holmes, Oscar Pederson and other groups, and for those who lacked this athletic ability the Chemical Bar, with a stock of surprisingly new chemicals served refreshments. The antics of Hugh Conover, Ken Short and the other "Mad Men", kept the 1,500 couples constantly on the alert.

One of School's many contributions to University spirit, was the organization of the "Chariot Races" which drew entries from nearly all faculties. Under the energetic guidance of our Director of Publications and Publicity, Rick Hill, the race was run in a truly School manner.

Hardly had we revived from the School-At-Home and the Chariot Races, than Bruce MacLeod and the School Nite Committee had us rolling in the aisles of Hart House, with the best show on the campus this year. Special praise to Jerry Fairhead, Bill Flanagan and Bob Muddiman for their untiring work in the production of the Revue.

In all these functions and especially School Nite it was the aim of the Society to have both campi share in the work, and the responsibility, rather than having it all done by one group. I feel that this end was accomplished as well as it could be since there were certain prob-

lems such as distance that were insurmountable.

The Debates Club under Bill Dimma provided us with many interesting discussions during the year.

The Club chairmen, in addition to their duties to the individual Clubs took on much extra work in order to make the year a bigger success. They were always willing to share in the added responsibility of the Society's work.

Another service to the students was the inauguration of Noon-hour films. In addition to filling in the long day, these programs were designed to help members of the Society better appreciate the subjects on the curriculum.

Some say that on Election day, the Society broke an old tradition, but I am sure that those who attended the post election dance, enjoyed this departure and that it will eventually also become a lasting tradition.

Open House, introduced a few years ago, to aquaint the friends of the students with their work, was an attendance shattering event. Under the guidance of Herb Dederer, many exhibits were presented by the various Departments and all enjoyed a most outstanding evening.

A special word of credit must go to John Wilkie and his staff for the change in policy of Toike-Oike. For this year our favourite publication was enlarged and published every two weeks. To Ken Hunter, the Editor of this 62nd edition of Transactions and Year book, for his patience while awaiting write ups, and his expert handling of this year's book, must go our thanks.

The Athletic Association under the able leadership of Jack Swan has moved up much higher in the Reed Trophy Race, and much has been done to further participation in all sports. Congratulations to Jack and to Bill Nord for winning the Bronze S and the Phene Memorial respectively.

The General Meetings were well supplied with speakers, and the Graduation Ball was the top Social event for 4th year, due to the untiring efforts of the president Chris Miller. Bill Clark kept 3rd year well supplied with dances and entertainment during the year.

The Society store under Gord Campbell did an increased business this year, and the extra profits were returned to the students by means of reduced prices. Bob Graham and Jim Bester both did a splendid job as Secretary and Treasurer respectively.

And to the 1st Vice-President, Bill MacDonald, the thanks of the whole Society and myself for the tremendous job so well done during the year. It was a pleasure to work with you, Bill.

It is impossible for me to name all those who have worked so hard on behalf of the Society this year, for the list of names would cover many pages of this volume. But I know that they cannot help but feel a definite sense of pride in having done such a good job for School. And I am sure I speak for every one in the graduating class when I say that I am proud to be a School man and to those of you who will return next year "Keep School's spirit high!"

To my successor John MacCrodan, I wish a most successful year and I hope that your term of office will be as happy as mine.

General Meetings

Chairman—T. C. W. Little—*Vice Chairman* W. O. C. Miller

The first General Meeting of the Engineering Society was opened with an interesting address by the Honourable D. R. Mitchener, Provincial Secretary. Mr. Mitchener spoke on Openings in the Public Service for Engineers and how the Provincial Government provides these openings.

December 10th

The Honourable Dana Porter, Minister of Planning and Development of Ontario, explained the pressing importance of flood control, and outlined the methods his department had put into effect up to this time.

January 20th

Mr. W. J. Davidson, Administrative Engineer of General Motors Technical Centre, gave a dynamic and well illustrated address on the General Motors Proving Grounds.

February 10th

Dr. R. S. Jane,—Vice-President of Shawinigan Chemicals in charge of Patents and Research delivered an enlightening address on Patents in the Chemical Industry.

FIG. 1. (photo) "Harbinger," Canadian designed two-seat sailplane which is now under construction.

High Performance Sailplane Design

By
B. S. SHENSTONE, M.A.Sc., F.R.AE.S.
(Mechanical, 1928)

I. INTRODUCTION

This article is just a sketch of the fundamentals of sailplane design. It tries to do no more than indicate why sailplanes look the way they do. See Figure 1. No attempt could be made in one article to discuss detail design or strength requirements or stability and control problems. However, since some original work on sailplanes is now under way at the University of Toronto, some attention has been given to this particular project and its developmental possibilities discussed.

II. General

Compared to other aircraft design, the design of sailplanes is attractive because it is straightforward. It may be called a pure problem. It is simply an aerodynamic-structural compromise based on natural requirements. Powered aircraft are designed around relatively arbitrary man-made requirements which change rapidly, so that any long line of consistent development is seldom possible. But sailplane design has developed steadily as the natural requirements and the means for coping with them have become known to us.

Unfortunately there is no magic about it, and the only way a sailplane can stay up or gain altitude is for it to meet upcurrents sufficiently strong to keep it up. In order to keep aloft often and for long periods it is obvious that the first requirement is to design for a low sinking speed, that is for a low vertical component of the speed of flight.

In the early years this was the only requirement recognized. This resulted in the design of slightly animated umbrellas which were difficult to control, but also led to very clean high span monoplanes using high lift wing sections. Since in those days soaring consisted only in riding the upcurrents caused by wind being deflected up a hill, such gliders were sufficiently good. However, as soon as people started to fly from one ridge to another, across a space with no upcurrents, it was realized that in addition to a low rate of sink, a flat glide was necessary. It is clear that by flattening the glide less height would be lost in flying over such a gap.

Later developments showed that to obtain the maximum range in the limited hours of effective soaring weather, another factor, "penetration" had to be considered. Penetration means high speed with a flat glide. How these three factors, low sink, flat glide and penetration affect design is described below.

Conditions of flight for sailplanes lie often outside conditions used for powered aircraft. This is best illustrated by reference to the well known lift-drag polar as shown in Figure 2. Powered aircraft operate entirely below the best glide condition (higher speeds) but gliders operate above it for minimum sink conditions and are thus quite near the stall. Only when cruising fast does the sailplane approach the normally used aircraft lift coefficients.

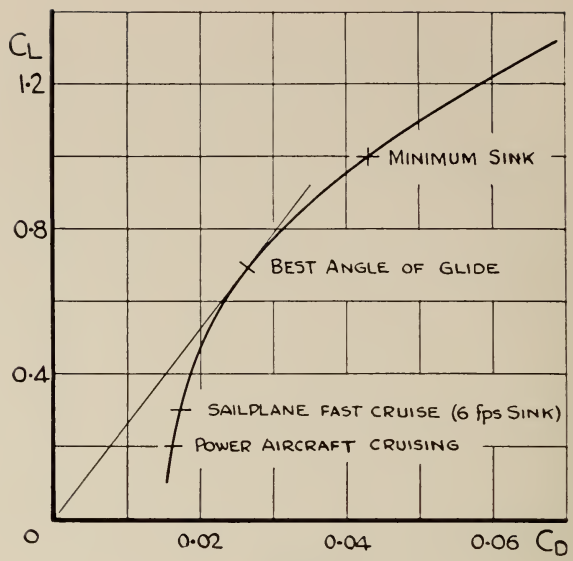


FIG. 2

FIG. 2. Polar curve showing operation regimes for aeroplanes and sailplanes.

III. Design for Lowest Sinking Speed

No glider worth mentioning would glide more steeply in its ordinary operation than say 1:15. It is therefore safe to equate the resultant of the vertical and horizontal speed components to the horizontal component. With this simplifying assumption it can be easily shown from first principles that the sinking speed is:

$$V_s = \sqrt{\frac{2W}{\rho S} \cdot \frac{C_D^2}{C_L^3}} \qquad \ldots\ldots(1)$$

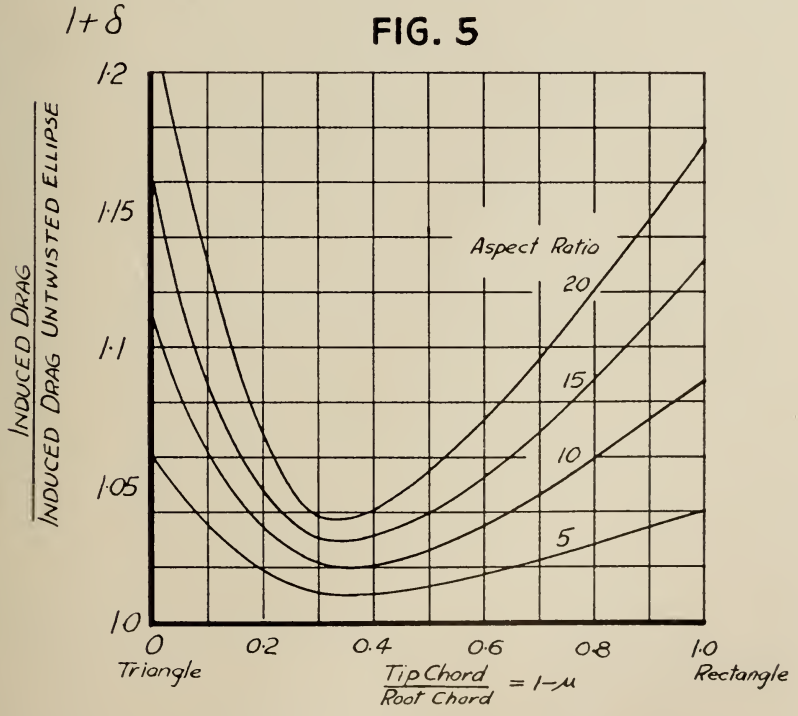
or $$V_s = 29\sqrt{w}\,\frac{C_D}{C_L^{3/2}} \text{ for sea level conditions} \ldots\ldots(2)$$

or $$V_s = 29\sqrt{\frac{W}{b^2}} \cdot \sqrt{A}\,\frac{C_D}{C_L^{3/2}} \text{ for sea level conditions} \ldots\ldots(3)$$

From equations (1) and (2) it is seen that to obtain a low sinking speed the wing loading (w) should be as low as possible. The drag coefficient (C_D) should also be low, which is consistent with

low wing loading. The last term doesn't indicate that some attention should be paid to having a flat glide and shows clearly that conditions of low sink occur at high lift coefficients or at low airspeeds.

Following this line of thought some early gliders having very low rates of sink were built. Such design concentrated on low weight and large wing areas. They usually had rectangular wings extensively wire braced and extremely light fuselages having light and primitive fairings. Such gliders could certainly remain aloft in weak up currents, but their light wing loading made them very slow fliers, not very responsive to the controls. They were unable to cope with strong hill upcurrents caused by high winds because their low speed became less than the horizontal wind speed, and they tended to be blown over the hills and far away.



At the same time that such contraptions were being built, people were looking at another solution which may be seen from Equation (3) which is merely a re-arrangement of Equation (2).

This shows us that if the span loading (weight/span^2) is low, which means a high aspect ratio, the sinking speed is low. However, the next term asks for a low aspect ratio. One can reduce the drag coefficient by cleaning up the aircraft as well as by making the wing large. So why not use a moderate wing area having the optimum aspect ratio and cut out parasitic drag as much as possible? It would result in a simpler and faster machine.

A proper examination of the last term $C_D/C_L^{3/2}$ will clarify this point further. We may assume that as a first approximation that the sailplane polar may be expressed as:

$$C_D = a\,C_L^2 + d \qquad \ldots.(4)$$

where $a = 1/\pi A$ for elliptical plan wings

$= \dfrac{1+\delta}{\pi A}$ for other wings. For values of $(1+\delta)$ see Figure 5. $d = C_{Dmin}$

This simplified form for the polar is used here for clarity. It is only correct for a small part of the polar and if more precision is required, further modifying terms should be added. By dividing through by $C_L^{1.5}$. we have:

$$\frac{C_D}{C_L^{3/2}} = a\,C_L^{1/2} + d\,C_L^{-3/2} \qquad \ldots.(5)$$

If we find the minimum value by differentiating with respect to the lift coefficient and equating to zero, we have:

$$C_L = \sqrt{\frac{3d}{a}}$$

This is the lift coefficient for the minimum value of $C_D/C_L^{3/2}$. The minimum value for this quantity is therefore:

$$\frac{C_D}{C_{L\,min}} = \frac{4}{3}\sqrt[4]{3a^3d}$$

To make this as small as we can it is obviously more worthwhile to reduce (a) as much as possible rather than work on (d) which has a lesser influence.

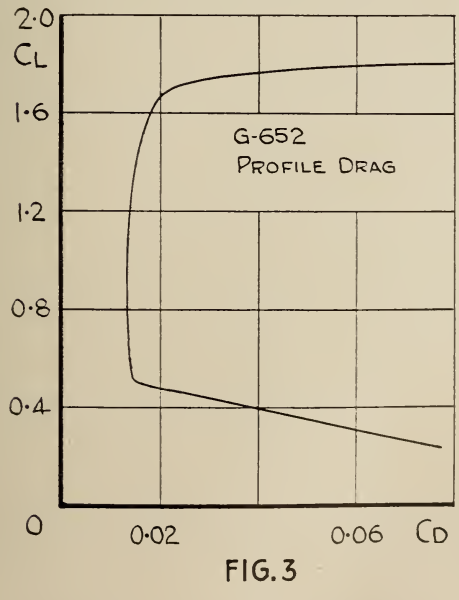
Reducing (a) means reducing the induced drag or increasing the aspect ratio. However, before one does this it is necessary to check on the required lift coefficient. After all, Equation (4) is quite oblivious to the stall and can give quite impossible lifts

if one does not watch it. If we assume a series of sail planes having elliptical plan wings and take $d = 0.02$ we have:

Aspect Ratio	5	10	15	20	25
$3d$	0.06	0.06	0.06	0.06	0.06
a	0.064	0.032	0.021	0.016	0.0127
C_L	0.962	1.375	1.68	1.94	2.17

The table shows that as the aspect ratio is increased the required lift coefficient for minimum sink conditions increases to far above the maximum for any normal aerofoils. This accounts for the use of very highly cambered wing sections on the early gliders. In 1930 they were using cambers as high as 10% and somewhat higher when section Goettingen 652 was used. Apart from high lifts the sections were developed to have low drag at high operating lift coefficients without regard to drag at lower values.

Even the highly cambered high lift sections used could not produce operating lift coefficients as high as those in the table for the higher aspect ratios. One might put a limit of 1.6 on the maximum attainable value. Hence we cannot fit wing sections to the higher aspect ratios. However the effect of deviating from the ideal is small being only $3\frac{1}{6}\%$ for aspect ratio 25 and lift coefficient of 1.6.



The above discussion shows why the early tendency in sailplane design was toward highly cambered aerofoils. This tendency continued until speed became a desirable quality in cross country flying. A highly cambered aerofoil (do not confuse camber with thickness) has a polar like that shown in Figure 3. Although at high lifts its drag may be quite low, at lower lifts the drag is high. It is as if the flaps were down. That is in fact just what a high camber aerofoil is, a built-in per-

FIG. 3. Polar for highly cambered wing section, G.652

manently deflected flap, but superior to any known flap as far as drag is concerned.

So far we can say that reducing the drag coefficient by increasing aspect ratio is important for low sink, although for higher aspect ratios the gain is less. It is also clear that any reduction in parasite drag coefficient is useful.

We can now picture the low sink sailplane. It has a large span, a highly cambered aerofoil and a low wing loading. The order of dimensions would be 60 to 70 ft. span, an aerofoil with 10% camber and maybe 18 to 20% thick at the root and a wing loading of 2.5 to 3 lb./sq. ft.

So far we have mentioned only the externals of the sailplane but have paid no attention to the internal structure that makes the machine possible. The wing loading and span loading have important effects on the performance. It must be clear from the discussion so far that if one goes on indefinitely increasing aspect ratio, the wing weight will increase unduly and that a stage will be reached when aerodynamic gain is balanced by weight gain. Weight estimation is more difficult than aerodynamic estimation and as a result the designer gives himself more freedom with weights. There are many schemes and formulae for estimating weights, and of course few of them quite agree. Expressions for wing weight are sometimes of the form:

$$W_w = pS + rb^3 \qquad \ldots\ldots(6)$$

and sometimes like this:

$$W_w = \frac{kA\,WnS}{ut} \qquad \ldots\ldots(7)$$

p, r and k are special constants which are worked out by trying to fit the formulae to existing wings. Preferably more precise and therefore more complex expressions should be used to take account of more variables. Unfortunately there is no room here to give such formulae and the reader is referred to the many papers on the subject.

For fuselage and tail unit weight, one can use an expression of this form:

$W_{f+t} = mb$ where m is another constant to be found. When a design study is made, for each configuration the weights of the structure, chassis, controls, equipment and load have to be

estimated. Initially the weight may be roughed out by simple formulae to find the approximate optimum conditions but later a more carefully worked out weight list should be made. What the calculated optimum conditions or size will come to will deviate from the true optimum proportionately to the designer's skill in estimation and his skill in design. It is this personal equation combined with the unknown true optimum that gives such problems their attraction. This is more marked if an actual design can be built and tried out.

IV. Design for Flat Glide

To visualize the necessity for a flat glide in addition to low sinking speed, it is sufficient to realize how necessary it is for the sailplane to be able to bridge gaps of no lift. From 2,000 ft. with a gliding angle of 1:15 one can glide about 6 miles, but with a gliding angle of 1:30 one can glide 12 miles. The attitude of best glide lies (Fig. 2) at a slightly lower lift coefficient than that for best sink. One is flying somewhat faster, but the lift coefficient is still high. Since

$$\text{Gliding Angle is Lift/Drag} = L/D = \frac{\text{Weight}}{\text{Drag}}$$

$$= \frac{W}{\frac{1}{2}\rho v^2 C_D S} = \frac{w}{qC_D} \qquad \ldots\ldots(8)$$

it indicates that for a given weight the drag must be low. The weight may be increased as long as the drag does not increase as much. This indicates that here again is a condition where there is an optimum to be found. The definition of gliding angle also says that the wing loading is to be as high as possible as long as C_D is not increased. The drag coefficient may be reduced, but to do it by lowering the wing loading is not a good way. It is really the easy way out, because if the parasite drag is not increased by adding wing area, the value of C_D will, by definition, decrease. One can imagine a fuselage remaining constant in size as the wing area is increased. The drag of such a fuselage would become an ever smaller proportion of the drag and as a result, the gliding angle would improve. The disadvantages of low wing loading have already been mentioned.

Further investigation will show that if angle of glide is given prime consideration, the optimum span or aspect ratio will come out very high, rather higher than can be handled in practice.

What are these limitations? The main trouble is that very large spans (say 70 ft. and over) are unwieldy. The sailplane lacks manoeuvrability. Just about the time that designers began to produce such fine optimum sailplanes cloud flying was developed which required excellent turning manoeuvrability to keep the sailplanes in the narrow thermals. Up to that time little attention had been paid to ailerons, but now it became an essential problem.

This is hardly the place to discuss the involved problem of aileron response and effectiveness. The overall result of the turning requirement was an increase in aileron size, particularly in chord near the tips, modification of wing form to prevent tip stalling, and an increase of wing taper. In addition it became clear that some designs had gone beyond the optimum span if manoeuvrability is taken into account. A high span sailplane that cannot manoeuver in a thermal will lose altitude quicker than a lower span sailplane that responds quickly.

The overall result was a generation of sailplanes with spans of the order of 55 to 65 ft. and with excellent roll manoeuvrability. The rate of roll attained was of the order of 5 seconds for a roll from 45° bank on one side to 45° bank on the other, at normal cruising speed.

V. Design for Penetration

The latest development, but not the last, has been the urge towards higher cruising speeds at low rates of sink. A sail plane having a flat glide at high cruising speed is said to have good penetration. This requirement has come about naturally as the distance record has increased. It is now over 500 miles in a straight line. To cover such a distance between about 11:00 a.m. when thermals become active and the late afternoon when they disperse gives one at a guess about 8 hours of flying in the summer as a maximum. To fly 500 miles in this time would require a cruising speed of 62 mph. When one considers that due to turning and deviations maybe twice the straight line distance would be covered in such a flight, it is seen that at least 150 mph. cruising speed is necessary for the job.

The necessity for high efficient cruising is particularly clear under head wind conditions where a slow glider would make no progress but a fast sailplane could cover a great deal of ground.

Sailplanes designed around the flat glide requirement cruise at something like 50 mph., so it is seen that much improvement is necessary.

To see clearly the factors involved it will be useful to examine the general sailplane performance curve. This is the graph of sinking speed against forward speed and is shown on Figure 4. On such a graph a series of lines representing the gliding angles can be superimposed. We can state that sinking speed is:

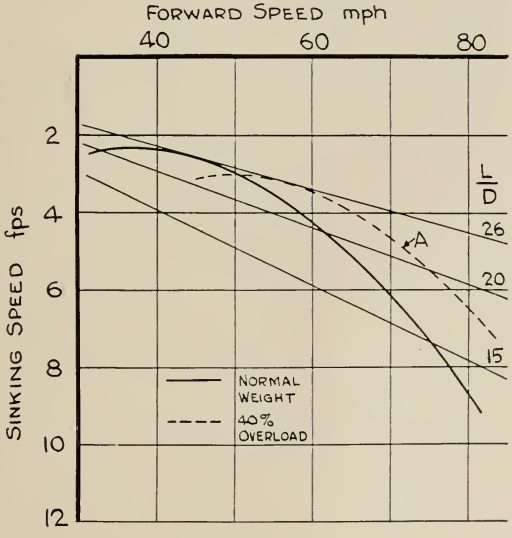


FIG. 4

FIG. 4. Typical sailplane sinking speed curve

$$V_s = \frac{V C_D}{C_L}$$

but

$$C_L = \frac{2W}{\rho S V^2}$$

Repeating Equation (4) we have:

$$C_D = a C_L^2 + d$$

$$= \frac{1+\delta}{\pi A} C_L^2 + C_{D\,min}$$

For values of $(1 + \delta)$ see Fig. 5.

$$\therefore \quad V_s = \frac{\rho V^3 C_{D\,min}}{2\frac{w}{s}} + \frac{(1+\delta)\,2W}{\rho\pi A\,VS} \qquad \ldots\ldots(9)$$

or at sea level for elliptical wings:

$$V_s = 0.00119\,\frac{C_{Dmin}}{s}\,V^3 + 267.8\,\frac{W}{S}\cdot\frac{1}{A\,V} \ldots\ldots(10)$$

In Equation (10) we have two interesting terms. At low speeds the last term is of greater importance than at high speeds. At best gliding angle conditions the terms are equal in value. At best rate of sink the last term is of greater importance. The requirements for light wing loading and high aspect ratio are consistent with our discussion above.

When we look at the first term we find a very different picture. As soon as we deviate from requiring low sink at any speed and require it only at high speed, we find that we want:

High wing loading
Low minimum drag coefficient

In the nature of things it is difficult to combine low drag coefficient with high wing loding. The more you cut down your wing area the higher is the drag coefficient, for a given fuselage and tail unit and wing thickness. The problem is to reduce these drags as far as possible to prevent the drag coefficient from rising.

There is an alternative. A given sailplane can simply be increased in weight by loading the wings with water ballast so that the cruising speed increases. The over-loading does not affect the gliding angle or drag coefficient as they are independent of weight. But the minimum sinking speed is greatly affected by weight.

It will be obvious that the danger to be avoided is that of designing only for the fast cruising condition. If that is done, one has a performance curve rather like "A" in Figure 4. The performance is good at high speeds but hopeless at low speeds. One wants good performance allround because even the highest speed machine must at times cope with weak up-currents.

Let us summarize what we want:

At Low Speed	At High Speed
Low sink	Low sink
High Aspect Ratio	Moderate Aspect Ratio
Low wing loading	High wing loading
High cambered section	Low drag section.

We must compromise as follows:

We use a relatively low drag wing section which is ideal for high cruising speeds, but we add a low drag flap (slotted or Fowler) to increase the camber we need for low speed low sink flight. We keep a high aspect ratio to help us at moderate and low speeds. We make the wing as thin as we dare to reduce profile drag for high speed. Lastly we decide what our minimum sink is to be and use the maximum wing loading that will permit such a sink to be achieved.

The result is a sailplane with a heavy wing. The weight is necessary to obtain the performance and in such cases it is worthwhile. One can, of course, go too far in weight expenditure, but to achieve good penetration with good low speed characteristics increased structure weight is more worthwhile than it is for purely flat glide or low sink designs. It is well to reiterate that there is no all-round advantage of weight "per se". To achieve the all-round sailplane the additional weight must result in useful aerodynamic advantages.

Only by paying special attention to wing form and controls can such heavy wing types have good roll manoeuvrability.

Alternatives to the all-round machine are to be found in some quite small heavily loaded (5 lb/sq. ft.) American types. I call these "Tropical Types" because their minimum sink is high, more suited to tropical or desert conditions where thermals have very high velocities. For Canada and other temperate places, it is unlikely that they would be very successful. Such designs, neglecting the low speed requirements in favour of penetration are easy and straight-forward to design, but are limited in usefulness.

Another alternative has been mentioned above, that of overloading by ballasting. Ballast must be placed in the wings unless a severe reduction of strength is acceptable. The technique is to take off with ballast usually in the form of water. If upcurrents are powerful enough the flight can be completed at high speed. If the upcurrents are weak, the ballast can be jettisoned and flight continued at a lower weight. It is unfortunate that there is no way to retrieve the ballast after it has been dropped.

VI. Aerodynamic Layout

For normal sailplanes with tails, the basic arrangement is that of a slim body housing the pilot, who is slightly ahead of the

wing to balance the aircraft and to get the best view. Nowadays the pilot is totally enclosed in a transparent canopy except in training types. The usual tail surfaces are at the aft end of the fuselage. These may be the normal three surfaces or two surfaces in butterfly form.

The wing may be above the body on a cabane on top of the fuselage, or may be set on or into the body. For open cockpit types the wing should be located above the body to avoid interference from the pilot's exposed head. When the cockpit is covered, the wing position is more at the choice of the designer. The simplest design is certainly the wing just on top of the fuselage, although practically all positions from low wing to high have been tried. What is best aerodynamically is likely never to be certain, as the result depends on the strength of mind, intuition and skill of the designer in spite of the amount of wind tunnel work and other data available. The writer feels that the wing with its top surface tangent to the top line of the fuselage, and carefully faired, is probably as good as any position.

On high performance types the fuselage is carefully shaped for least drag. Sometimes the general shape is a simple streamline and in others the fuselage is bent or curved in side elevation to conform to the local airflow. In others the fuselage is merged gradually into the wing, becoming more or less part of it. In sailplanes of very high performance it is usual to have no break in the fuselage profile, there being no windscreen in the normal sense. The whole nose is transparent. However, such a layout does not give the best view and pilots often prefer a good windscreen and think it worth the loss in performance. Recently there has been a tendency toward the use of bubble canopies reminiscent of those used on single seat fighters.

For tailless sailplanes there is as yet no accepted layout because there have been very few examples built. In order to avoid the fuselage altogether, the prone pilot in the wing may be the best solution and has been used successfully. It is quite possible that the ultimate sailplane may be tailless as there may be more scope for reducing parasitic drag in this type than in others. The problem, apart from any stability and control problems, which are immense is to avoid too great an increase of induced drag due to the many functions that the wing must fulfill.

WINGS

The wing is perhaps the most interesting design aspect of sailplanes. It tends to be of great span and aspect ratio. It is thin and flexible. It is the heaviest part of the sailplane.

It is well known that for a given span, the elliptical plan wing has the least induced drag. A number of the earliest refined sailplanes used elliptical wings. As spans increased it was realized that the wings were tending to weigh too much and recourse was had to increasing the taper (ratio of root to tip chords) to reduce weight, bringing the centre of lift closer to the fuselage and reducing the root bending moment. It was also found that high taper improved lateral control without making the ailerons too heavy to handle at higher flight speeds. On the other hand lateral control tended to be worse at the stall or near it, due to early tip stalling. Also the induced drag was worse as shown in Fig. 5. The tip stalling trouble was overcome by reducing the incidence of the outer wing sections and altering their shape, but this usually further increased the induced drag.

It is not difficult to see that if a highly tapered wing is lighter than an elliptical wing, it can be made of greater span than the elliptical wing for the same weight. It is indeed possible to make for a given weight a highly tapered wing having less drag than the elliptical wing. However, this favourable condition will exist only over a limited range of incidence, and at higher speeds such highly tapered and twisted wings will have very high induced drags. For the earlier sailplanes which operated always at low speeds on hill sites, such wings were satisfactory. Even for the flat glide types they were quite good. Tapers up to 4:1 and 5:1 were used with twists (washout) over ten degrees. Such machines were well fitted for their jobs, manoeuvrable and light.

The necessity for the wide speed range mentioned above resulted in wings which had to have low drag over a wide incidence range. Since the fundamentals indicated that it was worth considerable weight to achieve the low drag, the weight factor became less important than it had been for the earlier low sink sailplanes. This led back to wings of more elliptical form and having less washout. Some designers have given up washout entirely for the sake of improving the induced drag and have used slotted ailerons to give good lateral control near the stall.

We have dealt with the general type of wing section used and traced its development from moderate to high camber and back to very little camber. The thickness of sections we have not touched. The thickness/chord ratios of use vary from about 20% to about 9% although there are examples lying outside this range. Generally speaking, one uses as thin a section as possible. What is as thin as possible is not a precise thing. A clever designer can "get away" with a thinner wing than others.

What constitutes the thickness or thinness of a wing as a whole? A wing may have a thick root section and yet by virtue of a high aspect ratio, be as thin as it could possibly be. A short stubby wing with a 10% root section might be quite thick. It may be wiser to avoid the term thickness and refer to wing slimness. A slim wing is one whose thickness is a small proportion of the semispan. In a cantilever beam, a basic proportion is the ratio of the depth at the support to the span. As far as wings are concerned, we shall call the ratio of the semispan to the maximum root thickness the cantilever ratio:

$$C = \frac{\text{Semispan}}{\text{Root Thickness}}$$

One should take the distance from the wing-fuselage attachment to the tip, but since that is seldom known such refinement is hardly worthwhile. Sometimes the ratio: Span/Mean Wing Thickness has been used as a criterion for slimness, but mean thickness is also difficult to discover.

Cantilever ratios up to about 70 have been used on gliders. The value of 20 might be taken as a low figure. For powered aircraft the range of values is quite different, being from about 12 to 25. Any sailplane wing with a value of C over 50 may be considered to be slim. A sailplane wing with a root chord of 4½ feet and a 16% root section would have a cantilever ratio of 32 if the span is 45 ft. If the span were 72 feet the value of C would be 50. Although both wings have identical root sections and chords, the former is not slim while the latter is slim.

Modern sailplanes with slim wings use root sections as thin as 12% or even 10% and tip sections as low as 9% or 7%. Modern tapers are of the order of 2:1 or 2.5:1 and the designer expresses his individuality in the kind of tip he uses.

The writer has glibly mentioned the high values of cantilever ratio that have been used. It is not easy to make a successful slim wing. Such wings are prone to troubles such as flutter and control reversal and must be designed to stiffness criteria rather than for strength alone. Many an unsuccessful wing has been flexible in the wrong place and early development saw a number of failures in flight.

Any rough criterion such as the cantilever ratio must be used carefully. In particular cases there are always modifying factors, and nothing takes the place of detailed calculations.

The qualities desired for wings may already be clear to the reader. For high speed sailplanes we need a wing section with low drag coefficients under cruising conditions. Sections such as the NACA 23,000 and NACA 4,400 families and Goettingen 549 are often used. To obtain good low speed characteristics, slotted flaps are being used more often nowadays, and are necessary on low cambered sections for allround performance. Actually the process of choosing a wing section for a sailplane is not very satisfactory due to the lack of published tests under free air turbulence conditions. As a result one tends to use sections that have been used successfully before. There has been some attempt to use laminar flow sections but no data are available to the writer to indicate whether their use is worthwhile.

Sections are often varied over the wing span, usually by reducing the camber near the tips. Often a symmetrical tip section is used because at the Reynold's Number involved they have very gradual stalls. However their maximum lift is small, and other designers have used quite high cambered tip sections because of their high maximum lift coefficient. Other designers use constant sections throughout the span or at least the same section centerline.

Gulled or cranked wings have often been used to keep the wing tip well clear of the ground and also because it is believed to give certain advantages in lateral stability.

VII. Structural Layout

Most sailplanes are of wooden construction. They are of wood because wood can be finished very smoothly and presents a glossy surface to the air. Also wood is cheap for short runs. High performance sailplanes are always short runs. If they were built in large quantities, metal might be cheaper. Some types are

built with wooden wings and steel tube fuselages, which is also cheap but not as attractive or as smooth as plywood.

Wings are usually of the single spar type, the spar being located at the maximum depth of the section. The nose of the wing back to the spar is usually plywood covered to resist torsion and also to give the smoothest possible wing surface. The rest of the wing is usually fabric covered although some types with very slim wings are completely plywood covered.

The wooden fuselages of high performance types are plywood covered over a frame and longeron system with no unusual features. Modern types are equipped with a single central landing wheel slightly aft of the centre of gravity with a sprung skid forward. In the forward part of the fuselage are hooks for aero-towing, winch launching etc.

Light alloy fuselages and wings have been built by a number of people and there are examples of all-metal sailplanes such as the French SO-P1 and the American Schweizer 1-21. These tend to be very expensive.

VIII. University of Toronto Glider

So far the writer has considered only the highest performance type of sailplane in various stages of its development. More often sailplanes of good but less than optimum performance are required. The sailplane being built (1948) to student designs at the University of Toronto comes into this category and it may be worthwhile to follow through the background of its design so we can see why it is as it is.

The idea was to obtain an advanced training type with a fairly low minimum sinking speed of 2.5 fps. At the same time it was desired to keep it quite clean aerodynamically and as simple as possible. The span was to be limited so that the machine would not be too big or too expensive. Such practical points always arise to temper one's theoretical ideals. Actually we wanted to keep the span down to 40 feet. The investigations were made on a conservative basis and it appeared that the span would have to be increased to 45 feet. If a lower span were used the wing loading would have to be very low indeed, resulting in a big slow machine. Even with the 45 ft. span it first appeared that a wing area of something like 200 sq. ft. would be necessary (Aspect ratio of 10). Further investigation showed that there was very little loss in

reducing the area to 175 sq. ft. at the same span ($A = 11.6$). This resulted in a smaller shorter aircraft with more speed.

After the dimensions had been decided, more careful estimations of performance indicated that the machine would do better than expected, but rather than cut down the span to fit specification. It was left alone. Figure 6 shows the performance.

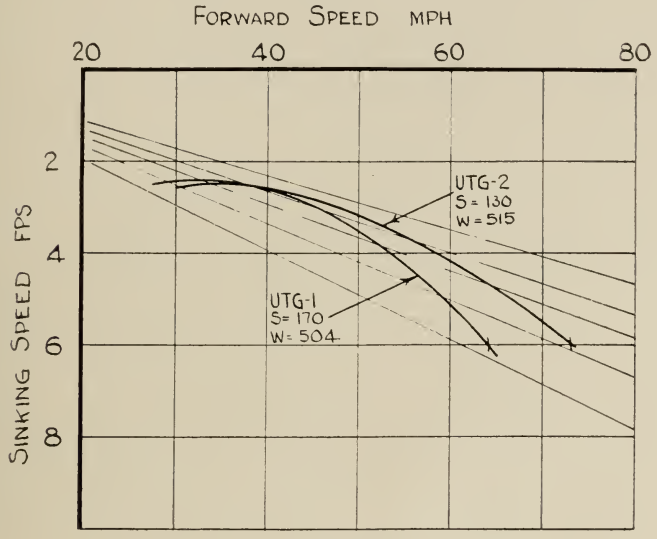


FIG. 6

FIG. 6. Performance of University of Toronto glider

Originally a fairly thick root section (18%) was used but on further consideration it was decided to reduce it to 16% which gave a reasonable cantilever ratio of 32.

Some of these remarks indicate how ideas may alter during the progress of a design. In this case the original scheme was to produce a simple training sailplane with little attention paid to a good gliding angle. As the scheme developed it was realized that a more refined machine could be produced without more trouble and without sacrificing the original requirements.

The U of T glider is a good example of adding an arbitrary limitation to a design i.e. the span of 45 feet. If we assume that the span is to remain at 45 feet, it may be interesting to see what might be done to develop and improve the existing basic design. As now being built, the main characteristics are:

Wing Area	175 sq. ft.	Minimum Sinking Speed	2.4 fps
Aspect Ratio	11.6	Best Glide	22:1
Wing Loading	2.88 lb/sq. ft.	Speed for Min. Sink	33 mph.
		Speed for best glide	42 mph.

Speed at sink of 6 fps : 64 mph

A general arrangement plan is shown in Figure 7 and a photograph of a model of it is shown in Figure 8.

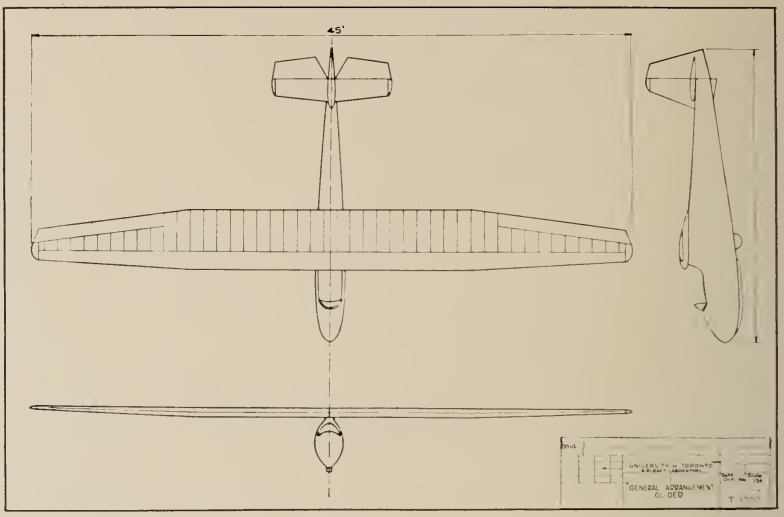


FIG. 7. General Arrangement of University of Toronto glider

FIG. 8. (photo) University of Toronto Glider. (Model)

The loadings and speeds shown above are quite low compared to a high performance sailplane. It is a slow machine, The simple wing form having a rectangular centersection was chosen as it was easy to build. So that simple ailerons could be used, there is 4° washout on the tapered part of the wing, and a change of section from NACA 4,416 to NACA 6,412 at the tip.

We could add speed to this glider by reducing the wing area. If we took an area of 130 sq. ft. and the same span of 45 feet, the aspect ratio comes to 15 and the wing loading to about 3.95 lb/sq. ft. The root chord would be reduced somewhat so that for the same cantilever ratio the root section comes to 18%. Such a wing might be designed with a continuous taper, no twist and slotted ailerons and would remain efficient over a good range of speeds. If at the same time we cleaned up the fuselage by adding an enclosed pilots canopy, the speed would be further increased. The new data would be:

Wing Area	130 sq. ft.
Aspect ratio	15.6
Wing Loading	3.95 lb/sq. ft.
Minimum sinking Speed	2.5 fps
Best Glide	23:1
Speed for Minimum sink	36 mph
Speed for best glide	46 mph
Speed at sink of 6 fps	73 mph

The improvement in cruising at 6 fps sink is quite useful and the general performance is good. Development need not stop here. With experience in design, the wing might be thinned down to a cantilever ratio of 50 resulting in a root thickness of 11.25%. A further development would be to lower the wing somewhat, making a lighter and more compact machine. This could only be done with an enclosed cockpit. The ultimate product would be the result of a logical development from the present simple design to a refined sailplane which would be the best attainable within the 45 ft. span limitation.

This University work was made possible by the enthusiasm of Professor T. R. Loudon, but whether or to what extent it will go on in the future depends to a great extent on the University students, both present, past and future. The staff can help in such matters, but the drive and the desire for accomplishment has to come from others who want to do original work of an unusual nature.

On the other hand perhaps the scheme of practical design combined with the experimental shop may become a recognized course as it has been in Europe for a generation at least.

IX. The Future Development

The development of the fast cruising sailplane has by no means been completed, but even now the next line of development is becoming apparent. It is the development of high altitude sailplanes to make use of the obstruction or helm waves in the lee of mountain ranges. These waves produce strong upcurrents at very high altitudes and already heights of about 30,000 ft. have been reached in sailplanes. However there must be special types developed having pressure cabin equipment and oxygen and so proportioned that they will fit the high altitude currents. There should be no difficulty in reaching 50,000 ft. and it is quite possible and no joke to suggest that some day the sailplane may wrest the altitude record from the powered aeroplane.

B. S. Shenstone

Symbols

A	Aspect ratio $= b^2/S$
a	$(1 + \delta)/\pi A$
b	Span ft.
C	Cantilever ratio : semispan/root thickness
C_D	Drag coefficient $= D/qS$
C_L	Lift coefficient $= L/qS$
D	Drag, pounds
d	$C_{D\ min}$
L	Lift, pounds. equals W in horizontal unaccelerated flight.
n	Ultimate load factor.
q	$\frac{1}{2}\rho V^2$
S	Wing area, sq. ft.
t	Tip chord/root chord.
u	Thickness/chord at root.
V	Speed, usually horizontal or nearly so. ft/sec. or mph.
V_s	Sinking speed ft/sec.
W	Weight, pounds.
W_W	Wing weight, pounds.
w	Wing loading $= W/S$ lb./sq. ft.
δ	$(1 + \delta) =$ ratio $\dfrac{\text{Induced drag of given wing}}{\text{Induced drag of untwisted ellipse}}$
ρ	Air density (0.0238 slug per cu. ft. at sea level).

YEAR BOOK
1948

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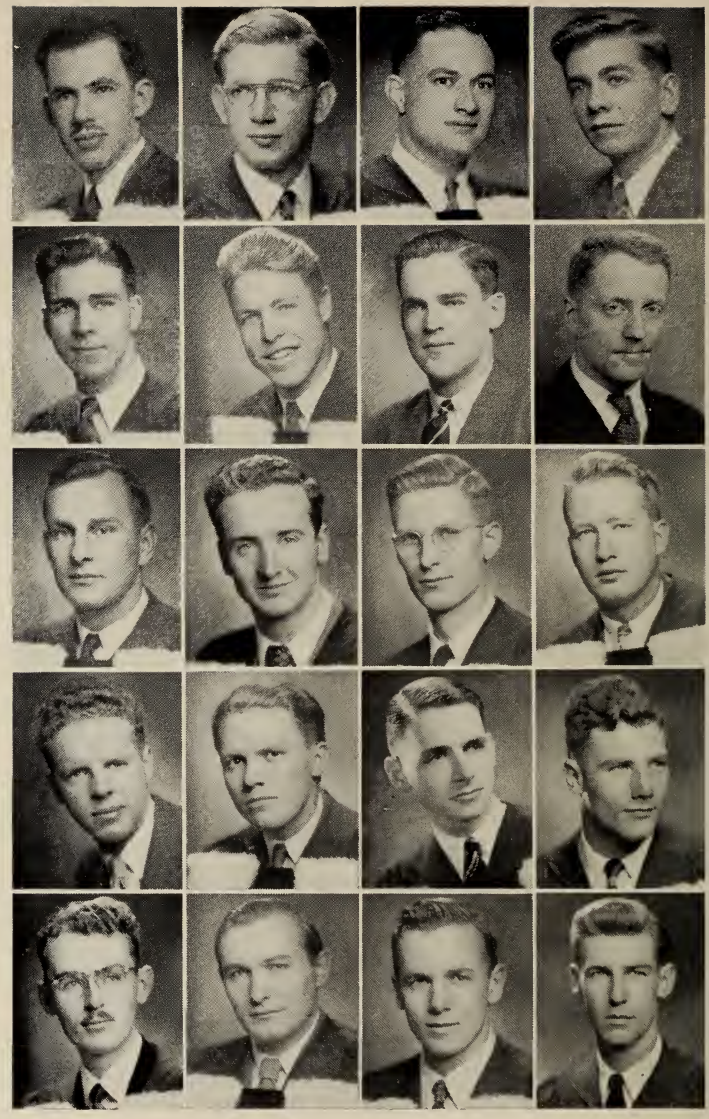
THE UNIVERSITY OF TORONTO



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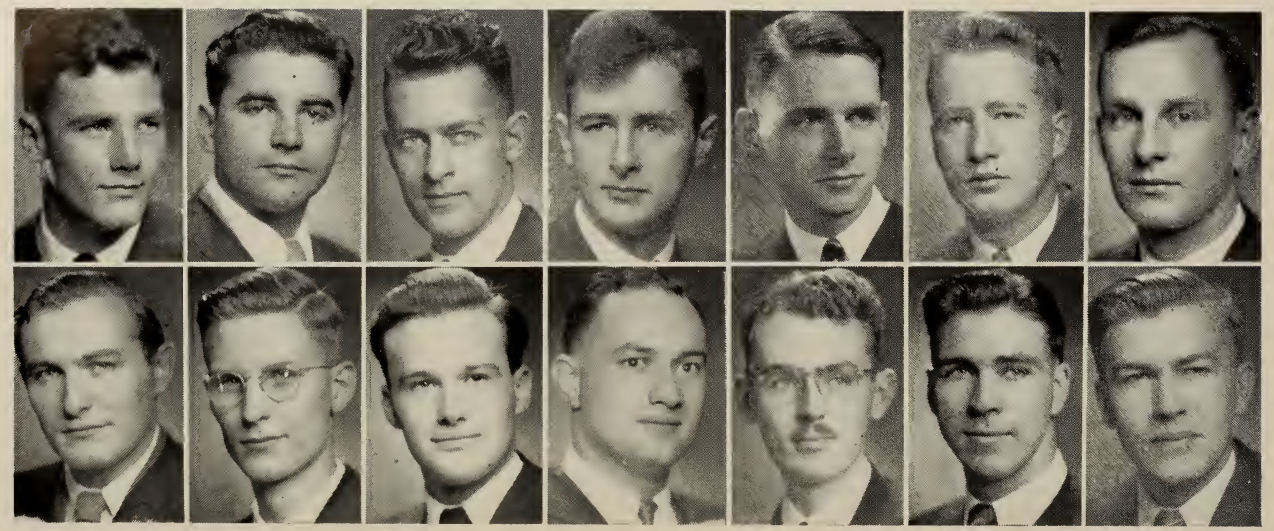

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MINING & MET.: F. A. Godfrey	ELECTRICAL: W. H. C. Beckett
MECHANICAL: H. Dederer	CERAMICS: O. J. C. Runnalls
ARCHITECTURAL: P. C. Sears	AERO: W. G. Carter
ENG. PHYSICS: H. V. Fullerton	ENG. & BUS.: H. E. Ansley

The function of the Permanent Executive is to keep the class in touch with one another, to further the spirit of fellowship in the class after graduation, to enable the class to play its part in the Alumni's contribution to the University, the Faculty and the Profession, and to render assistance to individual members of the class.

We have such a grand bunch of fellows and such a potential of good times together that it would be a shame to let the group disintegrate and the School be forgotten. The spirit of the class has been built by a close web of friendship and will be maintained the same way. It is here that we have made friends most easily, and least tainted with self interest or the pressure of business necessity, so let's work to keep these friendships which we value so highly.

Your first contact with the Permanent Executive will be when you are touched for a small contribution to enable us to send you news letters telling where all your friends have gone and what they are doing, and when and where the ever welcome reunions will be.

We ask you always to leave a forwarding address, and to send in any suggestions or news items which others would appreciate (marriages, births, appointments and jail sentences). We want to keep the class, the School interests and our friendships alive and active in the years to come, and with a continuation of the individual efforts which have characterized our undergraduate days, we shall. With your cooperation we can make this into something that will contribute much to your lives. Please mail all correspondence to the Class of 4T8, Engineering Alumni Assoc., 42 St. George Street, Toronto, Ontario.

Chris Miller

CIVIL CLUB EXECUTIVE

Back Row: J. M. Howes, J. M. Duff, C. B. Davis.

Front Row: W. D. McMurtry' Prof. C. Morrison, F. L. Blackhall, K. W. Short.

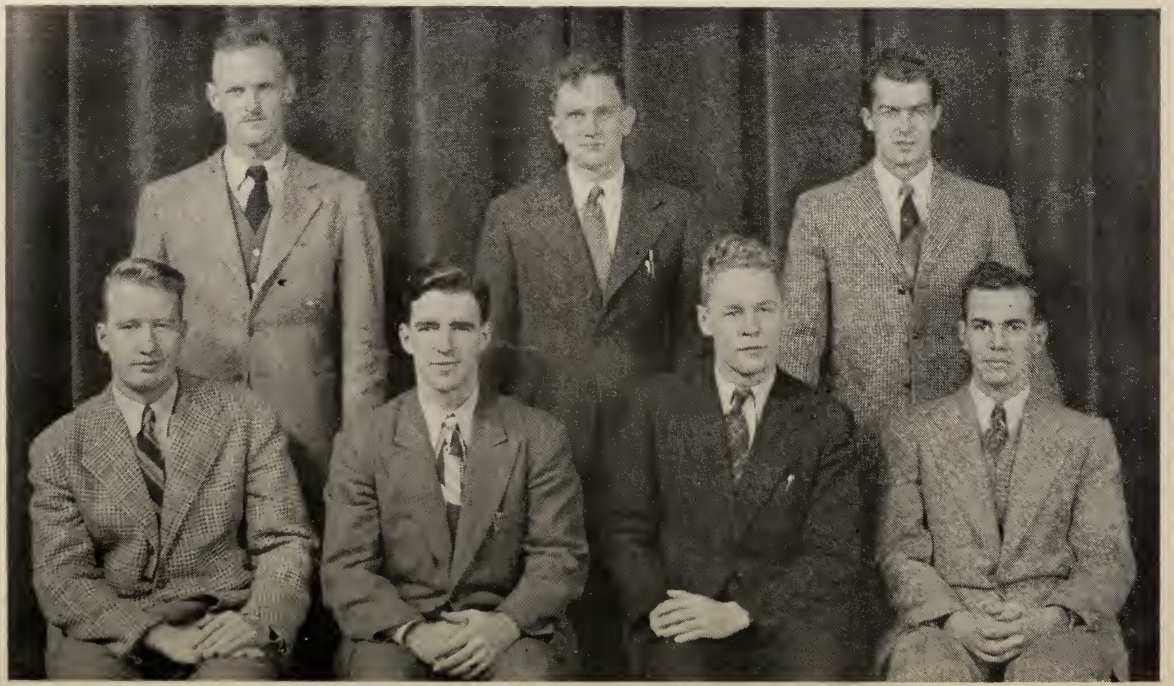
The Civil Club

THE Toronto Branch of the Civil Club made up of third and fourth years, found it difficult to co-relate their activities with the Ajax Club due to the transportation problems that would be involved with such large numbers. As a result, the functions of the club were designed for the third and fourth year students. It was the feeling of the Club that subjects for discussion at the meetings should be of a broader nature, not necessarily linked directly with the course of study.

The first meeting was November 18th, an informal smoker at the Navy Club. Here the class of 4T9, new arrivals to the Toronto Campus were welcomed by the Graduating Class under the leadership of W. D. McMurtry, the club chairman.

In December the Club held a Dinner meeting in Hart House, the speaker of the evening being Prof. Joslyn Rogers, Provincial Analyst. Professor Rogers gave a very interesting talk on "Crime Detection", illustrating his outline with a number of exhibits. His talk was interspaced with advice to student engineers, and was most enjoyable throughout. Professor Morrison, the Honorary Chairman, discussed the objectives and advantages of membership in the Engineering Institute of Canada and the Association of Professional Engineers of Ontario.

The final meeting of the year took place in the Hart House Debates Room on February 17th, following a Dinner in the Great Hall. Mr. J. R. Askin of the Abitibi Pulp and Paper Co. was guest speaker, the subject of his address being "The Pulp and Paper Industry in Canada." The speaker emphasized the major importance of this industry to the economic stability of our country, and also discussed the history and the future of this business. Movies of the development of a pulp and paper townsite illustrated some of the many engineering problems involved in this industry. The surplus of the Clubs treasury was used to purchase engineering handbooks which were raffled off at the end of the meeting.



M. & M. EXECUTIVE
Back Row: K. Brokenshire; E. N. Eley; B. W. Gilbert
Front Row: F. A. Godfrey; H. B. Spence; R. Stevenson; B. Laing.

Mining and Metallurgical Club

The first dinner meeting of the Club was held in Hart House, the guest speaker was Mr. E. J. Carlyle, Executive Director of the C.I.M.M. In addition to Mr. Carlyle's address on the Institute, a colour movie on the operations of the Anaconda Brass Co.'s open pit in Chichiquamata was shown.

The fourth year visited Fahralloy and E. Long Ltd. in Orillia. This field trip was greatly enjoyed by the class as the hospitality of our hosts was of the finest order.

As in an annual custom, the fourth year attended a dinner meeting of the Toronto Branch of the C.I.M.M. Dr. Camsell, President, of the Institute addressed the meeting. The Club always looks forward to these meetings and we sincerely appreciate the kindness of the Toronto Branch.

The usual smoker, held early in the fall, was well attended and everyone seemed to enjoy themselves.

At this date it is planned to hold a dinner meeting near the end of February at which time we hope to have Mr. Diamond of C.M.S. as the guest speaker.

Mr. Van Smith of American Cyanamid Co. Ltd. kindly accepted the Honourary Chairmanship of the Club this year. His help and advice were greatly appreciated by the executive of the Club.

F. A. Godfrey,
Chairman

MECHANICAL CLUB EXECUTIVE

1st Row: G. W. Schmidt; E. A. Allcut; H. Dederer; Col. H. G. Thompson; P. A. Charest
2nd Row: B. C. French; W. D. Bolster
Absent: F. V. Reddy

Mechanical Club

This year's activities were carried out with the close cooperation of the Student Branch of the A.S.M.E.

Proceedings were opened on November 24th with a dinner meeting in Hart House. A splendid talk on "Steam Power Plant Equipment and its Operation" was given by the guest speaker Mr. John G. Hall, Toronto manager of Combustion Engineering Corp.

On Tuesday, January 20th, after a dinner in the Great Hall, Mr. David Boyd, Works manager of The John Inglis Co. gave a talk on "Shop Engineering."

On March the 2nd, the Great Hall was the scene of the Annual Mechanical Club Dinner. After an appetizing dinner, Col. H. G. Thompson of Aluminate Chemicals addressed the meeting. The topic was "Engineering Maintenance Problems in the Army and the Formation of the R.C.E.M.E. Col. Thompson was the Honorary Chairman of the Club during the year and his services were greatly appreciated.

Field trips were arranged on two occasions for the Senior Students. The first trip was to De Cew Falls power development project on October 8th. Remember that dinner. On November 5th, the Dominion Foundries and Steel, the Steel Co. of Canada, both in Hamilton, and John Bertram and Sons plant in Dundas were highly successful.

In all the year 1947-48 was very successful and the executive wishes to thank the Club members for their support.

H. Dederer

ARCHITECTURAL CLUB EXECUTIVE 1947-48

A. G. Carswell; S. Butcherd; J. Owen; G. E. D. Ross; M. Rose
O. Melvaer; R. G. Calvert; P. C. Sears; D. Dnulop; W. Kyro
Absent: G. Mann

Architectural Club

THIS year was one of the most successful years in the Architectural Club's history. Many field trips were taken by the various years individually; second year visited Hamilton and both second and third year visited various manufacturers about Toronto. Fourth year spent a day with the Toronto Brick Company. The fifth year was unusually fortunate this year, to be able to take a week-long field trip to New York and Boston to visit some of the modern architecture for which the New England States are so famous. Later in the year a two-day trip to London, Tillsonburg, Simcoe, and Hamilton, was sponsored by the Brewer's Warehousing Company for the study of their retail stores. The Architects get around!

The most important highlight of the year was our exhibition "Architecture and You." A sub-committee of the executive, consisting of both staff and students and headed by Wally Kyro, our exhibition manager, worked all fall preparing the material for the show. To them must go the credit for making it the success that it was.

During the year the Architectural Club saw three films, on sculpture, painting, and one of an abstract nature that was highly entertaining. The Club has conducted a survey in conjunction with the Ontario Association of Architects and the Ontario General Contractors Association in order to facilitate student summer employment.

Socially, the Club has come of age. This autumn, after a series of last minute changes, the Club held its first "stag". It gave the Toronto members a grand opportunity to meet the Ajax members. In February the Club held the "Architects Ball" in the "Club Top Hat." We were pleased to see how this affair has grown in importance over the past two years, and we hope it will shortly become one of the "musts" of campus social life.

Ajax Architects have run their own show under the leadership of Ed McAndrew and have had a very lively and successful year. The staff and students of Toronto look forward to welcoming them next October, even if we have to move our tables onto the main campus to make room for them.

PAUL SEARS,
Chairman, Architectural Club

ENGINEERING PHYSICS CLUB

R. J. Uffen; Colonel J. Tuzo Wilson; H. V. Fullerton; M. G. Ryan; R. F. Harris

Engineering Physics Club

The opening meeting was a Film Night in the Hart House Debates Room. Three National Film Board documentaries were shown: "Power Valley"—the story of hydro-electric power development in the St. Maurice valley, "West Wind" in colour, the life and paintings of Tom Thompson, and "Man—One Family"—a British film debunking the theory of racial superiority.

At the next meeting, Dr. D. Y. Solandt of the Physiology Department gave an illustrated address on "Biophysics." The Club members took a keen interest in the subject, so that many questions were asked after the talk.

The Geophysics option of both years attended a meeting of the Coleman Geology Club in January. There, the noted Geophysicist Hans Lundberg told of using a helicopter for magnetometer surveys and described other methods used in his work.

Professor R. B. Jackson described a National Research Council project which he has completed, in which photographic methods were used to solve a complicated structural problem.

After the slides were shown, a discussion of possible improvements in the Course was held.

The final Joint Dinner Meeting will probably take place in March. The entire Ajax Engineering Physics Club will be invited, together with members of the Staff.

Numerous field trips were held by the various options. The Geophysics Options visited the H.E.P.C. development at De Cew Falls. Options 5s and 5c later shared a field trip to the Meteorological Offices on Bloor Street, where they saw the radiosonde lab. Also the X- and Specs" group plan a visit to the David Dunlap Observatory to learn about Astrophysics from Dr. Hogg.

The Refrigeration Option deserves much credit for organizing a student body of the American Society of Refrigeration Engineers. The entire option plans a trip to Buffalo, in conjunction with the A.S.R.E. It has already visited the steel mills and a tool machine factory in Hamilton. A trip to O.A.C. proved most interesting, especially regarding the low temperature physiology work there. Another trip is planned to Carbo Ice Company to observe the carbon dioxide industry.

This season, a series of interesting lecturettes was inaugurated for Third Year. The talks were given by the students themselves on topics of general interest suggested by their summer work. The lecturettes were very well received by the class.

INDUSTRIAL CHEMICAL CLUB EXECUTIVE
E. N. Banks (3rd yr. rep.) R. W. Vollete (3rd yr. rep.)
H. R. Jenkins; E. K. Brickenden; Prof. E. A. Smith; J. A. Walker; D. B. Mutton

Industrial Chemical Club

For 40 years the Industrial Chemical Club has played an active part in the life of the student chemical engineer. Through the various functions of the club the student is brought into contact with some of the interesting phases of college life which might otherwise have escaped him.

The activities of the club started on November 5th, 1947 at the Rideau Hotel where the Annual Smoker was held. Enough said! On December 9th, Dr. Joslyn Rogers of the University of Toronto was guest speaker at a dinner meeting held at Hart House, where he gave us a very interesting talk on criminology. On February 26th, the C.I.C. played hosts to a joint student C.I.C. meeting. Three of the Chemical Clubs in the University were represented there—the I.C.C., the Arts Chemical Club and the Ajax Chemical Club. Don Clarke, a IV Year Chemical Engineering Student, represented the I.C.C. and delivered a very interesting talk on Summer Employment. This Student's Night was declared a success and the executive of the C.I.C. feel that it should become an annual affair. The final Chemical Club Banquet was held on March 3rd at Diana Sweets where Dean R. O. Hurst, Ontario College of Pharmacy, gave us a very humorous talk entitled "Cleo was right." A class meeting is being planned for March 15th which will finish the activities for the year.

On the educational side of the picture are the annual field trips which commenced this year with the Toronto-Chatham-Sarnia-tour on October 30-31. On the 30th we visited the Dominion Sugar Refinery at Chatham and in Sarnia, the Port Huron Night Clubs. Room 101 of a certain hotel will probably stand out long in the memories of 4T8 Chemicals. To recuperate, the next day we visited Polymer and Imperial Oil at Sarnia. The next field adventure took place in the second week of December at the Ontario Pulp and Paper in Thorold. The third year had several trips to various plants—O'Keefe's Brewery, B.A. Oil Refinery at Clarkson and Canada Malting.

The Chemical Club contribution to the bar at the School-at-Home was a sight well worth seeing and many took advantage of the fact by coming back half-a-dozen times.

John Walker

ELECTRICAL CLUB

Back Row: D. C. Failey; D. N. Gillespie

Front Row: R. B. McCarter; W. H. C. Beckett; Prof. L. S. Lauchland; R. C. Short

Electrical Club

It was found necessary this year to divide the third year into three groups for the inspection trip to the Canadian Westinghouse and Steel Company of Canada plants, the groups making their visits on different days in order not to burden the facilities of both manufacturers. This field trip is of particular interest to the students of third year for at the Westinghouse plant they see electrical machinery of all sizes actually being built, while at Stelco they have a chance to observe countless applications of all types of electrical apparatus in one of the country's largest industrial plants. The trip through Westinghouse put an end to the student's difficulty of trying to visualize the types of transformer windings or the method of assembling coils on the armature of a rotating machine. At the Steel Company he saw the widest employment of direct current machines where their use solved technical obstacles unsurmountable with alternating current apparatus. Fourth year students inspected the new hydroelectric development at DeCew Falls, a site which Lord Kelvin had years ago turned down as useless. Later in the day they visited the generator station at Queenston where much of the power so vital to the industries of southwestern Ontario originates. In January there were two 'unofficial' trips for the men in their final year—one to Crouse Hindes where demonstrations of dust-proof, vapour-proof, and explosion-proof lighting fixtures and switch gear were given; the other to Ferranti Electric where each stage in the manufacture of distribution and power transformers and of regulators was explained. Some time was spent in the test laboratories as well.

Early in February Student Papers were delivered before a joint meeting of the Student Branch and the Toronto Section of the A.I.E.E. Later in the month the I.R.E. held their annual Student's night. Such meetings are invaluable to the students for it gives them the much needed opportunity to speak before large groups of comparative strangers. The grand climax to the Club's activities came on March 3rd, when a most successful supper dance for the Toronto section wound up the year's business and social functions.

W. H. C. Beckett.

CERAMICS CLUB

Left to Right: W. G. Coulter; Prof. P. M. Corbett; J. C. Runnalls; T. Ritchie

The Ceramic Club

With the beginning of the first term of this school year, the Ceramic Club began its second year of existence; and with the experience gained from its first year of activity, the Club was in a position to have a very successful year.

It was realized that only the closest cooperation between Ajax and Toronto could ensure the success of the Club. It was therefore decided that alternate club meetings would take place at Ajax, to ensure the full participation of the Ajax Students in their Club activities.

There were to be three main divisions in the programme, social evenings, addresses to the student body by outstanding authorities in ceramic industries, and conducted tours through local ceramic plants. The first two were to be undertaken by the club as a whole, and the last by classes individually to fit in with varied timetables.

The first social evening took the form of a banquet and dance at the Flyer's Club on October 24th, Professor L. J. Rogers, well-known analyst, spoke of his activities in connection with the Attorney-General's Dept. Ken Stephenson arranged a very novel dance programme. The evening proved to be a very sociable one.

During the first term, many field trips were arranged. They included tours of such ceramic plants as Cooksville Brick and Tile Co., Dominion Glass Co., Hamilton, Frigidaire Products of Canada, Leaside, and Moffat's Ltd., Weston.

With the assistance of Prof. P. M. Corbett, the club secured as guest speaker for a Dec. 12th meeting, Dean R. Scholes of Alfred University, N.Y. who chose as his topic, "Colour in Glass."

Two meetings are planned to complete this year's activities. On February 12th, Dr. C. J. Koenig, the Chief Research Engineer of Ohio State Experimental Station will be guest speaker when the club meets at Ajax. Arrangements are being made to have films shown at this meeting concerning the development of the American Nepheline Co.'s operations at Lakefield, Ontario.

The activities of the club will terminate for the session 47-48 with another social evening.

The Ceramic Club, therefore, points to the year of 1947-48 as one of great accomplishment and can look forward to its third year of existence with confidence of even greater success.

AERO CLUB EXECUTIVE
T. R. Loudon; W. A. Goodall; W. G. Carter; G. W. Reid; W. M. Bateman

Aero Club

INITIALLY the Club executive proposed to cover, in its meetings, four aspects of the field of Aeronautics—Aviation taken as a whole, Design, Production and Finance. Three of these topics will have been covered by the end of this term, Design being the one overlooked.

Activities commenced on the evening of October 14th, with a dance at the Embassy Hotel. Although the attendance was rather small, those present were very satisfied with the affair.

For the first of the above mentioned subjects the Club was fortunate in getting one of the most informed men in Canadian Aeronautics, Mr. Ron Keith, editor of "Canadian Aviation." His speech included some facts about air regulations, flying clubs and aircraft manufacturing companies in Canada.

The outstanding event of the year was a field trip to the National Research Council at Ottawa, which took three days. Leaving Toronto on the evening of November 27th, the next day was spent by the Club being shown through the entire Mechanical Division of N.R.C. which embraces aeronautical research. The tour proved to be extremely beneficial and the day was brought to an enjoyable end by the kindness of Mr. and Mrs. Dalrymple of Ottawa, who arranged a buffet supper for the club. Our gratitude is also extended to the Lord Elgin Hotel and the C.P.R. for their cooperation.

On February 16th Mr. J. Floyd of A.V. Roe Aircraft Company, spoke on the subject "The Problems of Producing a Prototype Aircraft." For an additional feature two sound pictures were shown. The final meeting was in the form of a banquet on March 18th. Mr. P. C. Garrett, Vice-President and General Manager of the De-Havilland Aircraft of Canada spoke on the financial aspect of aircraft production.

A very important feature in connection with the Aeronautical course was the inauguration, last fall, of the student branch of the Institute of Aeronautical Sciences. This Club will coordinate its activities with those of the Aeronautical Club and will make available the added attraction of the monthly journal of the I.A.S. which contains invaluable information on current developments in aviation. The parent organization of the I.A.S. is in the United States and has in its membership, both in Canada and the U.S.A., engineers of great repute.

Finally, it is befitting to take advantage of this opportunity to thank the executive and the members of the Club as a whole, for their enthusiastically inspired cooperation in making this session successful.

W. G. CARTER

ENGINEERING AND BUSINESS CLUB EXECUTIVE

Front Row: J. H. Mathers; F. A. Brownridge; H. D. Conover; T. S. Medland

Back Row: D. H. Copp; J. D. Mossop; G. S. Legate

Engineering and Business Club

THIS will be a big year in the history of the Club with the first group of members venturing out into the business world. The quality and value of any course can only be decided by the success of its graduates; however if outside interest, group enthusiasm, and already the offer of positions is any indication, this first group of graduates and and those yet to come haven't a worry. And it looks like the Engineering and Business Club will grow to be one of the largest Clubs at S.P.S. in the next few years.

This year the club activities have been centred on field trips which have been organized on free afternoons. The fourth year group had one out of town trip to the Steel Co. of Canada in Hamilton, where they saw steel production from the raw product to the finished article. Other trips were taken to a number of Toronto plants including the General Electric Co. of Canada, O'Keefes, Canada Wire and Cable Co., Frigidaire Products of Canada Ltd., and Gutta Percha and Rubber Ltd. At the time of writing other trips were being planned.

The third year group was very ably administered by the Vice-Chairman, Tom Medland, and in spite of the extra difficulties due to the large number of members they had some very successful trips. They visited Massey Harris Co. Ltd., O'Keefes and Viceroy Manufacturing Co. with others still to come.

One evening meeting was held February 25th, in Hart House, where two Time and Motion Study movies as well as the Algoma Bridge Collapse film were shown. The crowning social event of the Club will (as has been the custom) be a big party and dance on the evening of the day on which the last exam is written.

At this time we would like to extend best wishes to the Club and its new executive for a very successful year and also wish this the first graduating class every good fortune.

HUGH CONOVER

A.S.M.E.

Standing: Bob Armstrong; Jim Cook
Sitting: B. A. McLeod; Dr. G. R. Lord; J. B. Adams; J. J. Marta
Absent: D. Saunders; D. Smeaton

A.S.M.E. (Student Branch)

Now in its 14th year as an organized Club at S.P.S. the Toronto Student Branch of the A.S.M.E., with a membership of 250, has progressed to be the largest student branch of the A.S.M.E. in Canada and among the largest in the international student organization. It is partially supported financially by the parent society, from its headquarters in New York.

During these years, its members have expanded their scope of understanding, through the many club activities, the monthly issues of Mechanical Engineering and various technical publications which this year have been obtainable only for those of the graduating class.

Continuing the policy inaugurated last year, of co-operating with the Mechanical Club, a joint dinner meeting was held in Hart House after which J. H. Hall, Chief Engineer of Combustion Engineering Co., spoke on "Steam Power Plant Equipment and its Operation." Just prior to the Christian vacation, at a joint meeting with the Sr. Branch, A.S.M.E.—Lt. Col. T. Medland, Ex. Director of the Association of Professional Engineers enlightened the members on the seemingly rosy future of engineers in Canada. Mr. David Boyd, Works Manager of John Inglis Co., in addressing a joint dinner meeting with the Mechanical Club in January discussed the engineer's part on the production line, his relation with labor and unions and in general answered many timely questions regarding the profession.

Further meetings are planned which include a joint dinner meeting with the Mechanical Club and a speaking competition among the student members for cash prizes and the privilege of representing this branch at the Annual Student Branch Convention in the spring.

J. Bruce Adams,
Chairman

DEBATES

Left to Right: W. A. Dimma; J. Stanborough, John Mills; R. Love

S.P.S. Debates Club

THE S.P.S. Debates Club has attempted this year to renew interest in public speaking and debating among engineers. In this aim, it has fostered two interfaculty debates, an Intercollegiate debate, and a play-down inter-year debate for a trophy donated some years ago for presentation to the best debating team in School. In November, two School-men participated in a debate against two Vic girls, which proved extremely hilarious. On December 5th a debate was held with McGill at both Toronto and Montreal on the subject of professional unions. All labs and lectures in Engineering were cancelled for this event, and a fairly large crowd attended. Jack MacKenzie and Hal Humphrey of fourth year debated for Toronto here, while John Wilkie and Ken McNaught journeyed to Montreal for the debate there. Toronto broke even, winning in Toronto and losing in Montreal. In early February, Skule crossed words with the U.C. Parliament on the subject that Arts prepared a man better for life than engineering. Jack MacKenzie and John Mills teamed up to prove beyond a doubt (to some) that Engineering is a far superior course for any sane human being. At the time of writing, the play-down debate has not been run off, but it looks very much like it will aid considerably in promoting further debating interest. Small trophies will be awarded to each of the members of the winning team.

The executive of the Club, Jack Stanborough, John Mills and Bob Love have all helped to put the Club back on a sound basis, and it is hoped this growth and renewed interest will continue into '48-'49.

BILL BIMMA

TOIKE OIKE STAFF

Toike Oike

T*|æ5 O|æ5, the newspaper of the undergraduate engineering student, this year attempted something new in the line of publications. Previous years have seen the same old paper, with the same old jokes, come out at the same infrequent intervals. This year we felt that there were some changes which needed to be made if the paper were to justify its existence.

The first of these was to revise the masthead to read, "Published every two weeks by the Engineering Society, University of Toronto," instead of "every now and then." Our second change was to make it into a four page, tabloid sized newspaper, thereby presenting to the students a two-weekly résumé of School's activities.

Our aim was the desire to give to School's activities the publicity which their campus-wide success and popularity warranted. We also hoped to contribute in some small way towards more amicable relations between the Toronto campus and Ajax. We had some difficulty in closing the twenty-six mile gap between Toronto and Ajax, and where we failed, we regret it a great deal. However, we hope that next year, with the organization having been carried out in Toronto, we will be able to get all the Ajax news.

How long it will be necessary to continue publication in the manner which we followed this year is governed by many factors. It was obvious from the start of this year that The Varsity, operating on a fairly limited budget, and supplying low advertising rates, would be able to handle only the more startling of School events such as the Chariot Races. We felt that all School events are startling.

And so now we start the last paragraph of what we will ever write for S.P.S. as an undergraduate. We have enjoyed working with the many fine people at School—the Engineering Society Executives at Ajax and Toronto, our own staff, and the many others. We would be very remiss if we didn't mention the many who helped us each week to pound out the copy, and race against the deadline. To them all, Ed. Sokolowski, Jim Fydell, Jim Ellwood, Jack Dalrymple, Yon Shimizu, Buff Horton, Harold Morin, Bob McKague, and the ones we are sure to have forgotten, we would express our gratitude. To the rest of School, we hope we have given you a paper you have enjoyed reading.

J. R. Wilkie

SCHOOL DINNER COMMITTEE

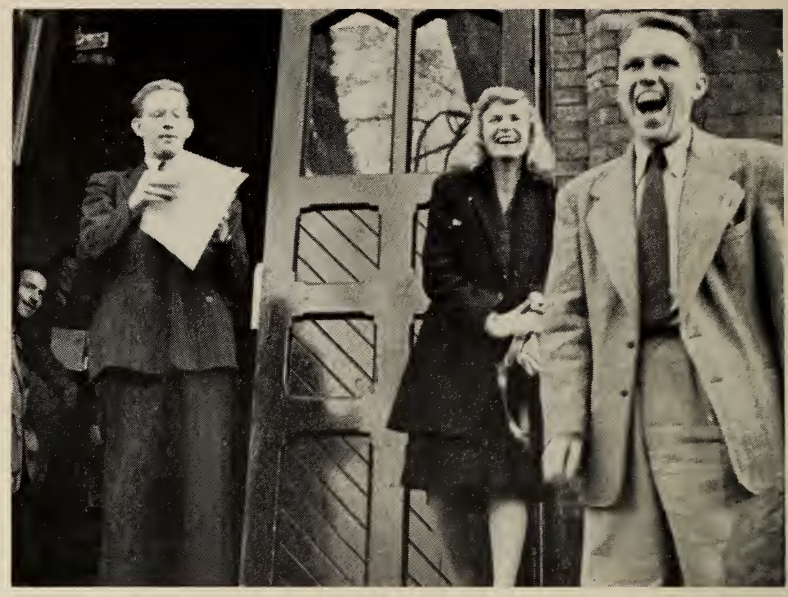
Back Row: Left to Right: Bob Oxland; Hal Davis, Bill Dimma; Bob Muddiman; Jim Bester
Front Row: Left to Right: Hal Blakely; Bill Walker; Garth McDowell; Bill MacDonald; Wallace Little; Rick Hill

The Year at School

ANNOUNCING . . . .

THIS year the boys in the back room got together and decided that School's Social functions were going to be different, better and brighter.

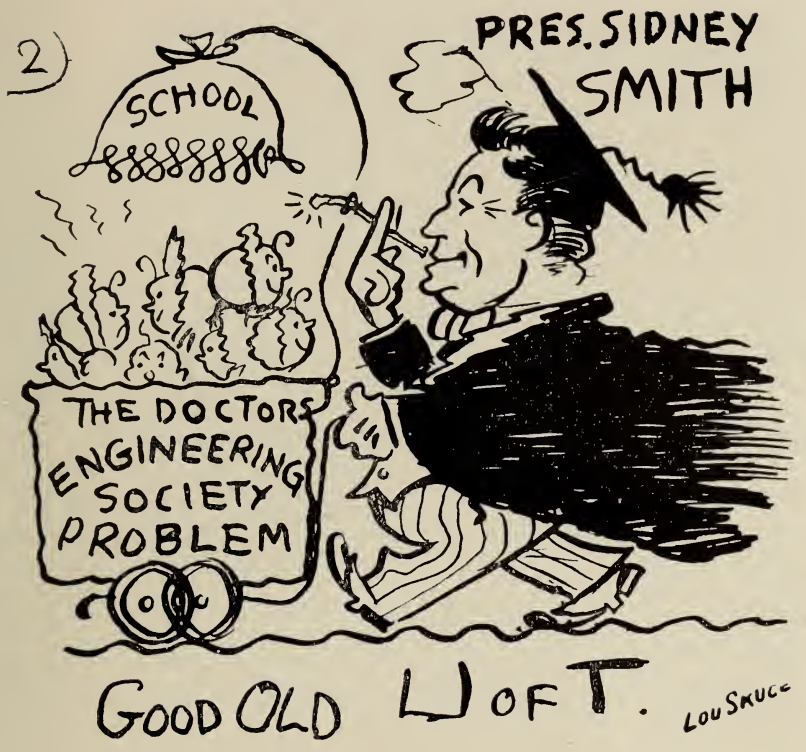
So with School Dinner in the offing they dug up not one but two new jokes and saluted them with forty blasts from the School Cannon while auctioning off the U.C. flag—which was flown at half mast for the occasion.



ACTION

Retiring into the back room they mulled things over and came forth with a blue print for a dinner that broke all precedents. The bus trip to Ajax alone was worth the price of admission, what with

REACTION



the singing of all the old familiar songs and the usual scintillating conversation. By the time of arrival at the banquet hall the promised steaks had turned into turkey but nobody minded, for hunger had done its work well. With belts eased out a notch or two everyone sat back while scholarships were presented.

General A. G. L. MacNaughton one of the great Canadians of our day delivered an address on atomic energy which was noteworthy for clear, sane, constructive thought-characteristics which are too seldom evident in dealing with that controversial matter.

Then the committee's bright ideas really materialized in the form of a Smoker at the Rouge Hill Golf Club. Just ask anyone who was there if the free beer and smokes, the entertainment of Lou Skuce's musical Cartoons, the good company didn't make the 58th School Dinner so memorable that it even lived up to the promises made at the auction.

SCHOOL-AT-HOME COMMITTEE

Back Row: Left to Right: Jim Bester; Bill Rankin; Maurice Rose; Jack Mansell; Bill Dimma; Lloyd Kyles; Bill Seeley; Bill Bell; Ken Short; Ted Hill

Front Row: Left to Right: Hal Blakely; Bill Walker; Garth McDowell; Bill MacDonald; Al Weir; T. C. W. Little; R. S. Hill

But before anyone had a chance to addle his brain too seriously with thought along came the School-at-Home to give an opportunity for a little action. And what a chance it was for action. Mix up Oscar Peterson, Johnny Holmes, a bar, several hundred engineers and a like number of beautiful gals and stir well in the ballroom of the Royal York and you've got a combination that can't be beaten. Everyone who was there will long remember the music, the bar, the decorations, the Ajax boys and their weird machines (What a way to wake up;) and the Chem Bar. Chemistry has its points—practical chemistry, anyway.

The At-Home being over, we copied out a few lab reports to keep our hand in, took a shot at basketball or swimming and otherwise marked time till that night of nights—School Nite.

Some talk of Scheherezade's thousand and one nights; Cleopatra's nights have some little fame and a whisper or two has been heard of King Arthur's nights. But these are as nothing compared to School Nites. It all began with the year's most talked of event—the Chariot Race. This unique publicity stunt shows all the attributes of becoming a tradition. The chariots—familiar two-wheeled vehicles provided by the street cleaning department pulled by colourfully clad two-legged steeds raced around the campus—the two School teams taking first place by some marvellous coincidence. The casualties were listed as four wounded, one missing in action.

SCHOOL-NITE COMMITTEE

Back Row: Left to Right: Jim Bester; Maurice Rose; Hugh Conover; Gerry Fairhead; Bob Muddiman; Bruce McLeod; Bill Flanagan; Bruce Adams; Bill Dimma

Front Row: Left to Right: Hal Blakely; Bill Walker; Garth McDowell; Bill MacDonald; Wallace Little; Rick Hill

Months before all this took place, the boys began meeting in corners and anyone listening could have heard the theme of the show being developed bit by bit. By December the girls were practising assiduously their 1-2-3 kick. Down in the basement some wild-eyed engineers were assembling a machine which could do anything but write lab reports.

AND THAT'S WHY WE GO TO COLLEGE

Then came the night—School Nite.

Poor little Hubert—brow beaten by professors and kicked around by demies, works on his machine. Then he discovers that the pill it turns out will make him big, strong and handsome—a great athlete and a great lover.

He takes over in the Romeo and Juliet scene and throwing away

LET ME SHOW YOU—

D.V.A. CHEQUES—EVERY DAY

Will Shakespeare's corny script proceeds to modernize things, with music and a chorus—a chorus of luscious lovelies who stole the show. But the effect of the pill wears off and poor Hubert is again his meek and miserable self.

This is, until the football game against Meat Ball U. Taking one of his magic pills he strode onto the field—powerful and assured—

almost to win the game with sparkling display of skill—but alas the pill wears off too soon and Hubert is only Hubert, forlorn and discredited. Nothing to do but drown his sorrows, in forty beers, but the source of all his troubles, Demie Suddick, follows him even to the KCR and torments him.

But Hubert wins in the end, for with a little Screech for lubrication from Doug Longman, the machine turns out a flood of D.V.A. cheques —dates every day!

"School is just a paradise
D.V.A. has paid the price
So put forty more on ice
For this distinguished engineer."

This smash hit show was directed by Bill Flanagan and Bruce MacLeod to whom no small part of the credit must go. Among the actors were such men as Lionel Ginsler, Pat Suddick; Garth McDowell and Bob Muddiman, playing Hubert's alter ego and Doug Longman playing so well the drunken bum. The Skule Nite quartet of Graham Kempt, Art Trott, Joe Elder, and Bob Thompson competed for honours with the Ajax foursome of Mat McLaughlin, Mickey McCloy, Mike Stoyanoff and Garth McDowell. The backstage crew did a marvellous job and much of the credit must be given to these unsung men who worked so hard and to such good effect.

What a night, we all said, and for the next few weeks it was the main topic of conversation. That is, until talk of the Grad Ball began to circulate.

The Grad Ball holds a special place in the year's activities, inasmuch as it is the last time that the men of the graduating class meet as undergraduates.

And so the class of 4T8 met at the Royal York Hotel in all the sartorial splendour of formal attire to dine together and to see their classmates presented with the gold keys emblematic of service on the Engineering Society Executive and the leather medals for service to School in various capacities.

Dancing to the music of Bobby Gimby then filled up the rest of the evening along with occasional excursions to the bar.

So ended a year which will give us all many pleasant memories through the years to come.

22

Survey Camp 1947

As usual the "scabbers" got a break. Arriving early, twenty-eight lucky so-and-so's were welcomed in the traditional Waldorf manner, and surrounded with lackeys, were escorted to the posh suites of the "Elite."

Then Robert "Call-me-Bob" Lye turned around and said "O.K., the rest of you bums, take your pick," pointing to the slums and the barn. As for me, I drew a triple decker with Shaw and the "Cat" as buddies. (Must admit the D4 was the more congenial of the two.)

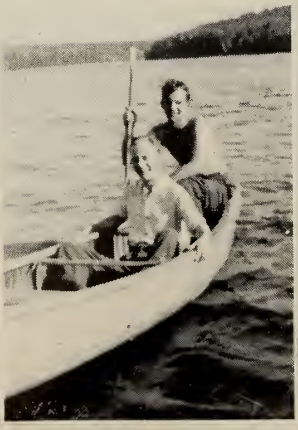
The first week wasn't so hard to take, what with Bigwin (remember the golf course) and Glenmount (what about the two lads that went swimming and swam for hours until the girls gave up and left the dock.)

After Labour Day we settled down to the more complicated things of life such as bridge, fishing, star-gazing, the Thursday night show and even got in some surveying.

Remember the wolf calls when the new waitress showed up, and the length of the sick parade line-up. (Marge was just like a mother to us.) And how the mob from 4T8, without the rigorous Ajax training managed to remain in sight, at least (of course the colonials led the way.) And then there was the heap of scrap with the Fergus license which was forever in the 1/s at Sta. A. I apologize, Johnnie. There was one night at Dorset when it looked like a Packard to me.

My Gawd, I never saw such a dry climate! What with traipsing over Smokeless Valley and diff. levelling to Dorset, the boys faded away to shadows. Then the big rumor. "It rains every day—except Sunday—in Minden." Commandeering every means of travel including one unfortunate porcupine, we were off. That night when we returned, the Minister of Education was assured of the fact that the Class of 4T9 did not let surveying interfere with its college education.

"Horizontal" Duff



4T9 Survey Camp 1947
or
Who Put the Transit in Mrs. Minto's Chowder?

THE year 1947 was the first in which the books at the "Minden Pub" have shown a profit. Some say it was the wet spring, leaving local farmers nothing else to brew . . . er . . . do. Others say it was the double Survey Camp, spring and fall. Who knows?

For the trip out, the Ajax "Green-Hornet" left much to be desired in the way of comfort but a few hardy crews managed to carry on the ancient and well known art of "bridge" building. Some say that we loaded the boats a little too heavily on the trip over from Sandy Cove. Not being a navy type, I didn't know the water wasn't supposed to come in over the side like that.

Squirrel Sanders, who was the only one to become proficient at making set-ups in the "Coast Range" along the north shore, comes from a long line of mountain goats. He sings, too, "I took my hat and fourteen dollars. . . ."

Davey MacLeod opened up a new era in motorcycles built for four. (Both were loaded, Davey and the motorcycle, that is.)

Gord Lawson managed to leave university and get married on the fortune he made in pepsi-colas. They laughed when he sat down to play . . . cribbage.

One afternoon a week the back field was turned into a hunt club—horses at cost. Later known as "Rodeo Day"—how was I to know that Sutherland was sneaking up behind with a steel-pointed picket.

They say that the boys in the second camp erected one of the strongest head frames ever known in the mining game . . . er business. Thanks to their ingenuity 4T9 has left something original as a reminder that through these portals passed . . . etc.

RUSS STEPHENSON

GRADUATES' ALBUM

4T8

ENGINEERING SOCIETY

THE UNIVERSITY OF TORONTO

GRADUATING CLASS CIVIL 4T8

Front Row: A. D. Duncan, Prof. Helwig, Prof. Huggins, Prof. Sagar, Prof. Morrison, W. G. Armstrong, N. Pappas, W. J. O'Neill.

Second Row: W. D. McMurtry, J. C. Cringan, G. E. MacIsaac, O. T. Linton, F. L. Blackhall, W. R. Ball, H. L. Johnson, M. S. Yolles, E. G. H. Yundt, E. M. Taylor, J. M. Spratt.

Third Row: M. A. McBride, J. R. Clendening, L. W. Stock, H. E. Cole, W. R. Kinnear, G. Martens, J. Hrutka, J. A. Ellwood, R. E. Manning, J. L. Shirley, W. B. Sproule, W. A. Trow

Fourth Row: M. Dimitrye, A. D. Finlayson, M. J. Kitchen, J. A. Cooper, R. N. Hadley, G. J. Harlock, P. J. Harvey, W. O. Chisholm, A. A. Ridler, K. W. Short.

Fifth Row: H. D. Monteith, A. E. Field, J. A. Robbins, W. J. McCann, W. L. Edgerly, R. G. Tress, P. L. Burgess, D. B. Redfern, L. G. J. Tenute.

Sixth Row: D. C. Cramn, G. R. Williams, F. E. J. Crome, B. A. Hastings, J. W. Thompson, P. Phillips, R. R. Hibbard, H. F. Rootham, P. A. Fellows, N. H. Robinson, J. H. Peer, L. E. Walker, C. S. Purser.

Back Row: A. H. C. Carson, R. E. R. Abraham, G. H. Curtis, H. N. Black, T. N. Hayman, L. E. Clark, W. B. Hamilton, C. M. MacGregor, G. Bagshaw, N. J. Campbell, B. R. Bennett, G. L. Ball, M. D. Arnaud, L. F. MacLean.

MINING AND MINING GEOLOGY

IV YEAR MECHANICAL ENGINEERING

First Row: H. Dederer, Mr. R. T. Waines, Prof. R. C. Wiren, Prof. W. G. McIntosh, Prof. A. E. Allcut, Prof. G. R. Lord, Prof. I. W. Smith.

Second Row: R. S. Hill, B. A. McLeod, J. C. Mills, P. F. L. Mansbacher, I. J. Karasievich, G. R. Morelloe, C. F. N. Broad, J. L. Atwood, J. A. Burnside, A. R. Askin, M. W. Hattin, J. D. Mahon.

Third Row: K. B. Bourne, A. D. Mann, T. R. McMurray, J. A. Jagielnik, M. A. Humphreys, F. C. Jones, R. J. Fennell, R. I. Gilchrist, G. W. T. Richardson, N. E. Rosewarne, J. E. Rose, G. P. Schwarzkopf, W. I. Marshall, J. Wisnicki, E. I. Piotrowski.

Fourth Row: J. B. Adams, R. M. Barr, G. R. Beach, B. A. Ellis, J. C. Corkery, W. J. Davison, V. B. Cook, E. H. Dudgeon, C. M. Yeates, F. H. Humphrey, F. H. Winn, F. H. M. Ridley.

Fifth Row: G. Granek, L. Maxmonko, J. H. Spaulding, A. E. Doig, J. G. Easson, W. R. P. Porter, D. A. Saunders, A. G. Fairhead, E. G. F. Sweet, J. S. Flavelle, J. R. Durant, G. A. Rogers.

Sixth Row: J. A. Maine, A. W. Tuovi, M. W. Cameron, W. D. Tanner, I. C. Rogers, J. D. Dearden, R. L. Kennedy, A. W. MacKinnon, A. H. Fallis.

Seventh Row: J. F. Townsend, R. J. Brown, B. L. Thibodeau, H. L. Bennett, J. W. Howard, W. D. Gosset, R. E. Fortin, H. Chikosfky, R. M. Cruikshank. B. C. French.

Eighth Row: R. A. Potter, W. E. Wheatley, W. H. Nord, E. W. Granfield, G. R. Muddiman, W. W. Twist, J. G. Plunkett, R. D. Stubley, W. E. Wilson, D. G. Kempthorne, J. J. Hefferman.

Ninth Row: D. K. Rivers, W. H. O. McLaren, J. Koblinsky, R. C. Wilkes, N. B. Corbett, C. E. Whitten, D. S. Ross, R. E. Cousins, K. G. Bentley, J. L. MacLaren, T. E. Britton.

Tenth Row: F. W. Partridge, A. D. McLaren, J. L. Meschino, L. O. Mark, H. W. S. Grasett.

Eleventh Row: G. M. Burns, W. A. Cook, E. G. Odette, J. W. McReynolds.

Twelfth Row: J. W. L. Goering, L. S. Ginsler, E. R. S. McLaughlin, R. Skitch, R. W. Boyd, G. M. Playfair-Brown, G. W. Percival, W. A. E. Frost.

Thirteenth Row: G. D. Day, T. D. Livingston, F. G. Milligan, S. S. Majury, J. D. Pawling, D. L. McEachern.

V YR. ARCHITECTURE

Standing Left to Right: J. E. Owen; F. E. Fletcher; W. Tronianko; H. D. Chapman; G. F. Y. Chan

Seated Left to Right: W. N. Greer; R. E. Murphy; Miss J. G. Robinson; P. C. Sears; Prof. E. R. Arthur

IV ENGINEERING PHYSICS 1947-48

Front Row: G. C. Alvey; D. J. Salt; J. H. Ratcliffe, H. V. Fullerton; Prof. K. B. Jackson; W. Kozak; R. A. Boorne; J. R. Bird; J. C. Likely

Second Row: H. A. Watson; C. A. M. Smith; B. M. Pullan; D. J. Wright; L. J. Loebach; A. A. Kusnik; J. M. Craig

Third Row: W. H. M. Burroughs; D. L. S. Bate; J. A. Agnew; J. R. Wait; J. B. Lewis; J. W. Rutter; S. Z. Mack

Fourth Row: T. W. Purdy; C. D. S. Bate; H. A. Shugg; M. Kurtz; G. E. B. Daniel; G. E. Lee-Whiting

Fifth Row: F. S. Grant; R. H. Squires; R. R. Taylor; G. K. F. Pepper; R. M. M. Sachs; W. M. Sehachter

Sixth Row: P. F. O'Rourke; M. G. Ryan; K. E. Hunter; F. G. Torrie; G. W. Johnston; W. O. C. Miller; R. R. Galpin; F. W. MaeNamara

Inset: F. M. Hill; J. S. Hodkinson; L. J. Hudyma; H. P. Koehler; D. K. Ritchie; A. I. Weinzweig

IV ELECTRICAL ENGINEERING

Front Row: P. G. Kingsmill, Prof. D. N. Cass-Beggs, Prof. J. G. Smith, Prof. G. F. Tracy, W. H. C. Beckett, Prof. L. S. Lauchland, A. B. Sturton, C. H. Busby.

Second Row: E. W. Hill, J. M. Puley, D. H. Kelly, K. S. Leeson, P. S. Thornton, H. N. Raymond, A. C. McLaren, G. Takeda, R. D. Nevison.

Third Row: F. R. Wilson, H. Joe, E. Gordon, M. K. J. Schurter, D. W. Bryant, D. M. Yurasyk, A. Shtun, W. C. Evans, J. A. Evans.

Fourth Row: J. R. S. Wilkie, R. T. Strickland, I. L. Colquhoun, B. Quan, W. G. Eriksen, F. C. Barnes, G. F. Feaver, M. R. Holman

Fifth Row: G. B. Wiswell, J. S. Russell, G. Kileeg, W. H. Hopper, P. A. Turnbull, J. P. B. McLoughlin, W. R. Stepkowsky, J. D. Wright.

Sixth Row: W. H. Seeley, G. S. Collins, J. L. Packham, G. F. Janaway, J. S. Ridout, J. Gilliver, M. K. Riddell, D. G. McTaggart.

Seventh Row: B. L. Campbell, B. F. Brown, W. H. Hamer, R. E. Penton, C. J. Urban, J. S. MacDonald, G. W. Barclay.

Eighth Row: W. Pukalo, R. F. F. Corley, L. Jackson, B. O. C. Fleming, R. F. Kissick, A. D. Blachford, W. F. Green, W. G. Forrest.

Ninth Row: F. J. Sievert, R. E. Westwood, J. L. Kappele, J. T. Bradley, G. W. Farnell, E. L. Knill, G. E. Wallace.

Top Row: J. A. Torrance, S. A. M. Robertson, G. N. Gillespie, G. E. Inns, N. B. Baylay, H. R. Baines, J. B. McCullum.

Absent: J. A. Armstrong, A. C. Bell, K. R. Campbell, R. L. Campbell, P. T. Dunn, R. E. Gamey, J. C. Gray, K. D. Guy, B. A. Hackl, A. Illes, R. A. Jackman, I. A. Morgulis.

4th CERAMICS

Front Row: Left to Right: J. S. Mutchmon; Prof. P. M. Corbett; Miss F. C. Bradfield; F. M. Cullen
J. C. Runnalls

Back Row: H. S. Ballantyne; J. S. MacNairn; A. F. Trott

IV METALLURGICAL ENGINEERING

Front Row: Mr. H. U. Ross; Prof. J. E. Toomer; Miss I. G. Warnock; Dr. L. M. Pidgeon; Prof. P. M. Corbett; Mr. B. M. Thall

Second Row: W. J. C. Lewis; J. W. Greenwood; N. G. Eley; J. C. Cutt; B. M. Richardson; J. G. Church; J. E. Allen; Mr. H. M. Ross; D. M. Archer

Last Row: A. E. Guay; J. J. Ellis; J. A. Green; P. Provias; W. J. Hannah; J. B. Clark; D. H. MacKay; D. H. Pawson

Absent: C. M. Bishop; W. A. Grell

IV AERO ENGINEERING

ENGINEERING AND BUSINESS 4T8

Front Row: Left to Right: J. A. Grierson; F. A. Brownridge; T. C. W. Little; F. A. Huycke; Prof. E. A. Allcut; H. D. Conover; D. E. Whitefield; J. H. Mathers

Second Row: D. P. Crichton; J. A. Howard; J. A. McLachlin; J. M. Milson; J. T. Woolsey; D. Blackburn; A. G. McNichol; W. R. Knight; H. E. Ansley A. S. Halpenny; W. J. Woolidge; R. L. Thompson; W. G. Beck; J. M. Mansell; J. P. Seiber; I. Singer; J. M. Holton; K. J. Kenyon; R. C. Shaw

Back Row: J. R. MacKenzie; F. W. Henkelman; R. F. White; A. B. Smieszko; F. H. McNeeley; I. G. Clark; J. A. Sarjeant; G. A. Zinn.

Absent: P. A. Cardinal; W. A. MacDonald; A. A. Weir.

CLASS 4T8 EXECUTIVE

Left to Right: J. Robbins; J. C. Cringan; W. O. C. Miller; W. McCann

4T8

The Class returned for this, its last big year, intending to miss nothing in the way of University extra curricular activities. We queued up in the middle of Saturday morning labs to get on the right flank of the $1.50 per season seats, and gave yell for yell with the University of Toronto; were mistaken for Queens men by the mounted policemen, but saved the pieces of goal-post—learned a few new songs on the way out to the School Dinner, and a few new stories at the stop on the way back;—went to the Club Kingsway for a year party, and to Western in sign-bedecked cars to witness, from cold wet gutter seats, the beginning of the end of Metras rugby championships; discovered that steel pipe goal posts are weak in lateral vibration, but can be dug, goodness knows how far, into the ground—had numerous class reunions that night between the lobby and the fifth floor of the Hotel London;—joined the Alumni for St. Nick's Ball and the rest of School for the School-at-Home and the St. Adele ski-weekend. The Class had two Grand Champion chariot teams, although one had to slow down momentarily in front of the School to be introduced to the class of 4T9, kept School Nite fairly "clean for the Dean,"—cheered the Hockey Blues to the Queen's Cup, the basketball Blues to the first of a long series of victories over Western, and Senior School to the Jennings Cup, and most recently we've been recording hobbies, cultural activities and spare reading for prospective employers.

We worked this year with the finest of fellows, never a report too pressing that someone couldn't let it drift to lend a hand. We look to a graduation, not breaking the class up, but providing it with larger opportunities of activity and contribution. Let's perpetuate the fellowship that we have learned these last few years.

We thank the Dean and staff of the Faculty for their fullest and most sincere attention to us.

Chris Miller

The Engineering Christian Fellowship

"To know Christ and to make Him known."

For several years now, a group of fellows at S.P.S. has been gathering together for Christian fellowship. As their motto suggests, the activities of the Engineering Christian Fellowship are towfold.

Knowing that a successful Christian life must be maintained by regular prayer and Bible study, the E.C.F. holds prayer meetings and discussion groups to stimulate the devotional life of Christian students.

Having found the joy of a new life in Christ, members feel it their privilege to prove by their lives, their words and by open meetings that personal faith in Christ brings not only forgiveness of sin, but it also provides the basis upon which one can live a significant life as a Christian and engineer.

As a part of the Varsity Christian Fellowship, the E.C.F. has participated in such campus-wide activities as Sunday morning services in Convocation Hall, a week-end conference, a weekly Bible Lecture Course and various social activities such as skating parties and Sunday evening firesides.

All Varsity students and Faculty members are cordially invited to all Fellowship meetings, especially those of the S.P.S. group.

On the executive for the year 1947-48 were:

Past President—J. D. Hisey
President—Murray Barrington
Secretary-treasurer—H. S. Reinke
Missionary Secretary—Sam Roge
Publicity—Paul Wiegand

Stanley Z. Mack,
IV E. P.

HOLD EVERYTHING "JOE"! HERE COMES "TOIKE McOIKE"
AJAX
1 MILE
UNIVERSITY OF TORONTO AJAX DIV.
WAR ASSETS
R.C.

Ajax Life

And it came to pass that once a great multitude descended upon that place which men call the U. of T., crying aloud that they were aflame with a burning desire for knowledge. Then those that are known as the Powers That Be took counsel amongst themselves, saying, "How indeed can we dispose of this howling mob?" And one amongst them stood forth and spake unto the rest. "Verily," he cried, "do I know of a place not thirty miles hence where the snow lieth deep for even eleven months of the year, and the howling winds clutcheth everlastingly with icy fingers at a motley collection of shacks. Let us send them there to test them, and those that return for the second year are keen indeed and deserve to be permitted to enter this hallowed place of learning." And it was so.

So, here, amongst the raging elements and vast distances, was born a new race, a shaggy multitude of ambitious but protesting Skulemen, for indeed this place was Ajax. And those that have seen this place recall the words of the Prophet, who once spake, saying, "Ajax extendeth many cubits in four directions, and foolish is he that attempteth to walk unto 214, for he shall not reach his class, but shall receive fallen arches in great profusion." Yet is it not necessary to walk to achieve this end, for it is equally easy to injure the feet by joining with the mob to catch an Ajax bus, in which pastime many arches are trodden flat.

Yea, and verily, is there also at Ajax the Hall of Eating, wherein the hunger-maddened engineer may vie with that foul representative of the canine race, that four-footed oaf, Red, for the bare sustenance which keepeth his body and black soul together. And he that consumeth this lean fare expendeth all the energy gained thereby in the vain and futile search for gen.

And he that passeth thru the Hall of Eating and retaineth his health shall pass on only to further tests, for is there not the Place of Drafting, where men labor long over the simple matter of drawing a straight line? For it seemeth that a line is not but a line, but that it must pass from one point even unto another. And a line drawn not thru the approved place is a Bad Thing, and an abomination in the eyes of the demie. Yet are there those that escape even from the eagle eyes of this demie, to come only beneath the myopic glance of another of the same ilk.

Yea, for Ajax is naught but an organized chaos, a great welter of strange persons called demies, and warped slipsticks and hordes of unshaven but dauntless Engineers. And don't let them tell you that they would like to be in Toronto and that they don't like Ajax. Because they don't.

E. G. F. Bryerson—"Guiseppe"

JOINT HOUSE COMMITTEE

First Row: Margaret Samel; C. E. Ells; J. H. McQueston; A. H. Jackson; D. P. Collins

Second Row: J. Bell; D. S. Sainthill; R. H. O'Grady; R. S. Morden; E. F. K. Carson

Third Row: R. Silk; J. E. Moran; D. A. Brooks; D. E. Parsons; E. M. Powell

Fourth Row: D. A. A. Woo; H. R. DeCaire; L. J. MacKinnon; B. A. Laughton; D. G. Wells

Fifth Row: R. L. Gray; E. A. Kershaw; W. J. F. Cosburn; E. Archer; R. T. Richardson, chairman

Absent: J. R. W. Parker

The Ajax Division Community

When the Faculty of Applied Science and Engineering extended to Ajax in 1946, it suddenly became the parent of the largest student residence unit in Canada. Even after three sessions, it is difficult to appreciate the size of the family which lives, and moves and has its being in the wartime huts on the Ajax campus. During the first session, nearly 1200 lived in residence, 2300 the second, and over 1800 the third session. Each of these figures represents approximately 70% of the total enrolment for that particular academic year.

With such a large group of students living, studying, playing and taking part in a dozen other activities, it is not surprising that Ajax has become a community with a certain identity. Attitudes and traditions are in the process of developing, with loyalty already firmly established. And it is quite evident that the students are proud of the achievements of Ajax.

One must not suppose that all the students consider Ajax an idyllic spot. Many look eagerly to their third year and life in Toronto; but equally as many prefer to continue their studies on the wind-swept flats of Ajax, where there is comradeship, simplicity of life and an atmosphere of study.

One reason why Ajax has been able to operate satisfactorily as a residence community is the fact that most of the students are veterans, accustomed to living together in huts and barracks. Instead of jumping from years of service discipline into the peculiar com-

plications of peace-time living, Ajax has provided an intermediate step in their rehabilitation. They have moved into an area which from the physical point of view is reminiscent of war days, but where they themselves are called upon to plan and regulate most of their own activities through elected committees. Each residence (there are 25 operating this session) manages its own affairs—domestic, social and athletic. The Joint House Committee, composed of the chairman from each student residence, co-ordinates all residence activities. It would be stretching a point to say that such form of control is without flaw, but there has been sufficient evidence of good government to show that the students are capable of handling even the most difficult problems. In some cases the management of a residence has been disappointing; in others, it has been carried on extraordinarily well.

Isolation, thin pocket books and open-faced weather have been contributory factors in introducing an Ajax student style of dress, that to say the least is unique, though probably very sensible. With the zero weather come greatcoats, windbreakers, old blue or khaki tunics, ski caps and other clothing oddments. But when a house dance or other social event to which outsiders are invited, the men of Ajax can meet anyone on equal terms.

All the daily routine activities such as riding the trailer buses, attending lectures, queueing for meals, paying fees, having a snack at the Tuck Shop and many others, give rise to frequent amusing situations which are lampooned by the students. Published criticisms are rare, which would seem to indicate that the men of Ajax prefer to keep their problems in their own yard.

One of the greatest advantages in this residence community is the fact that each day is regulated in such a way that the student lives fully, with little time wasted. Academic work naturally comes first, but inter-residence athletics, musicales and various other cultural and recreational activities, supply a desirable change of interest. But the scholastic atmosphere is everywhere evident, and to those who so desire, even a light snack in the kitchenette may be time profitably spent in discussion of some academic problem. As proof that the resident student has certain advantages, results have shown that those living on the Ajax campus have a better chance of completing their year successfully than the students who commute. The other benefits are less obvious, but it is reasonable to suppose that a selective group of eager young men, living together in a community will profit from their contact, and acquire a sense of values that is denied those who live a less comradely existence.

There will be many regrets when the ex-service pool of students has been used up and the Ajax Division closes its doors. By that time, there will be very few engineering students in Toronto who will not have known the joys of the great Ajax expanses and been "down the line" for lectures. It is likely that "Life at Ajax" will be a popular subject of conversation among young engineers for many years to come.

R. H. Perry,
(Dean and Supervisor of Residence)

ENGINEERING SOCIETY EXECUTIVE (AJAX)

First Row: W. Walker; G. A. McDowell; W. P. Smith; H. Blakely

Second Row: H. J. Wilson; J. Couse; J. M. Savage; A. J. P. La Prairie Ed Knight

Third Row: J. E. Moran; G. R. Partridge; J. C. Cameron; H. G. Joy; E. G. McAndrews; W. J. L. Clark.

President's Message

" - - - of shoes n'ships n'sealing wax - - - "

It's later than you think! And so, the time has come to speak of many things ere this term runs its course with only the "April hurdles" to surmount.

But rather than contemplate the future, it is more pleasant to deal in retrospect, and look back on the activities of that much maligned and oft misunderstood group known as the Engineering Society.

-------Imbued with great optimism and filled with the zeal of the newly elected, your Executive met last Spring to formulate its policy for the 1947-48 term. Primarily the Society is concerned with the activities and welfare of the undergraduate Engineer whilst at Skule. Therefore, it was realized that any undertaking should have as its basis, the philosophy of the Society, which is, "the greatest good for the greatest number".

In a tangible way we could discharge our obligations by wise and judicious spending of the monies entrusted to us. Not only must we ensure that the minimum of profit was realized in the stores, but also that the fees received from the Bursar on behalf of each student were used to subsidize club activities and various "Skule functions."

Such intangibles as promoting "Skule Spirit" (Oh! over-worked expression), "ennobling the Engineering Profession", and suppling programmes of "culture" flitted wraithlike in and about the assemblage and permeated our plans for the coming year.

Thus a pattern was evolved and the only problem that remained was to establish contact with the student body and keep them informed regarding the conduct of their affairs. The question of public relations received considerable attention, as it was generally admitted that there existed between the Executive and members of the Society an elusive barrier which could only be broken down by considerable publicity.

The upshot of this solemn conclave was the appointment of a three man commission. It was instructed to hibernate for the summer and produce a readable booklet, a booklet which would not only introduce the harassed, confused freshman to Ajax but also impress upon all students the part that the Society could play in his University life.

Being rather simple souls, the aspiring authors proceeded to lose themselves somewhere between Alberta and Alaska and managed to concoct a brochure entitled "Life Goes to Ajax". For those who were not fooled by the cover, this literary effort attempted, in a light jocular vein, to provide a thumbnail sketch of Ajax and expose the inner workings of the Engineering Society.

During the week of Registration, two fair members of the opposite sex, in a manner reminiscent of the "Sirens" who plagued Ulysses, cajoled and beguiled the innocent Freshmen into buying a year card and green ties! But soft, this is a tender subject. Lest this poor attempt at irony be misunderstood, it would be wise to point out, that a sincere attempt has always been made to explain the whys and wherefores of a year card. Even the most skeptical will agree, it is only by pooling the resources of each student, that the Year Executives and Society can provide functions of the calibre of the Engineers' Ball.

The story behind the Green Tie has oft been told. In passing, recognition should go to those who gave to its wearing a deeper significance. Last year's Executive, under the wise guidance of Mike McAuliffe, recognized the futility of initiation amongst a multitude of mature, earnest men and declared that hazing was "verboten". Instead, they offered a more fitting welcome to the wilderness known as Ajax. To ignore such a precedent would indeed have been folly for here was a "tradition" that could be respected and implemented.

In lieu of bloody noses, dishevelled clothing, et hoc, the incoming year were formally received in the "Rec Hall" and treated to an evening of fun and feasting.

Spark plugged by that bundle of Irish wit and energy, Garth McDowell, this Freshmen's Reception set off a train of functions which vied with each other in originality and magnitude of scope.

However, it is not my intention to eulogize the various events but to choose items here and there that seem to epitomise the basic philosophy of the Society.

Let us focus a searching light on the Annual Elections and appraise them keeping in mind the "intangibles" mentioned earlier in this epistle. During the fall and spring elections a serious attempt was made to "clean up" the campaigns as a whole. Posters were given a "new look" and campaign speeches were delivered under conditions that gave the students an excellent opportunity to assess the qualifications of the various candidates. For those who bemoan the elimina-

tion of "off-colour" jokes and mutter "it's tradition", it must be seasoned with old age and respectability. Time was, not so long ago, when the speeches given in Convocation Hall by undergraduate Engineers had some significance and displayed considerable originality of thought.

There will be those who grieve the passing of the annual trek to Shea's Annex and will claim that an Election Dance is a poor means of giving vent to good, "clean", boyish fun. Alas, gentlemen, you have reached man's estate and needs must put away childish things ----- besides, why keep yourself ta peashooter length from the fair sex? On that eventful Friday, February 27th, there was originated a custom that could easily grow into one of the most unusual functions of the year ----- an Election Dance!

There was another rare event that took Ajax by storm last November. Because it served to consolidate about every group on the "campus", the Engineers Ball rates special mention here and now. For its success, the Ball depended on the efforts of a few hundred people, ranging from the Art Class who lavished their talents on the murals to the Club Chairmen who handled such projects as displays, lighting, stage effects, check rooms and transportation. The highlight of both evenings was the residence coffee parties. Fortunately for the Executive of 5T0 and 5T1, who had their hands full with the multitudinous details of the Ball, the Joint House Committee headed by Bob Richardson took on all the arrangements for these parties. Meanwhile, The Director of Publicity and Publications, Harold Blakeley, was working quietly in the background devising unusual publicity methods and pulling strings right and left to get two well known exponents of the "New Look".

The work done by the Club Chairmen during the Ball was typical of their activity during the year.

Possessing boundless enthusiasm, they competed with each other to arrange the most talked about stag, to plan the most sumptuous banquet and to provide the most outstanding speakers. But most important, these same Chairmen were the backbone of the Society, infusing it with their initiative and purpose. Labouring long and diligently on behalf of the students, they more than fulfilled their obligations.

It is not my intention to give the Stores more than a passing nod at this time. In the near future there will appear an auditor's statement which can speak for itself. However, the fact that the

Society will probably end up the term indebted to no man is due in large part to Bob Oxland, the second vice-president, and Pete Smith, our canny treasurer.

Reposing in a safe in the lower store is a voluminous tome, wherein are inscribed, for all to read, the minutes of some fourteen meetings. The writing of such minutes is an arduous task, particularly during a stormy session. It is always a source of wonder to me, just how John Gregory, the Secretary, can produce from the heterogeneous collection of words which fly about the meetings, a readable record of our activities.

It has been said by our predecessors that Ajax is the fitting son of the parent Toronto Executive. Whereas Ajax has sometimes balked at the traces and treated their "elders" as impoverished relatives, in the main, our relations have been excellent.

With a feeling of regret and some relief I turn now to Hugh McMahon and his Executive wishing them every success for next year and offering as a small measure of consolation these words of Benjamin Franklin:

> "We must not in the Course of Publick Life expect immediate grateful Acknowledgment of our Services—But let us persevere thro' Abuse and even Injury. The internal satisfaction of a good Conscience is always present, and Time will do us Justice in the Minds of the People, even of those at present the most prejudiced against us."

BILL WALKER

BLAKELY POURS—LUCKY DOG!

First Vice-President's Report Ajax

In this great community of space, time and weather, many events have come into the ken of First and Second Year Engineering students.

It seems only like last September 24 (which it was) that the Freshmen Reception was held in the Recreation Hall for the benefit of all incoming frosh. Everything went famously, including several hundred pints of milk and coffee plus many hundred assorted doughnuts.

On October 23rd the Freshmen Reception Dance was held at the Royal York Hotel and some 460 couples danced to Benny Louis, laughed at Doug Romaine and drank fruit punch during odd moments from the punch bowls supplied.

The following week Skule's traditional Dinner was held again at Ajax. In spite of meat-packers' strikes and the manifold difficulties that had been besetting food establishments, the cafeteria staff at Ajax deserve heartfelt gratitude for a wonderful turkey dinner. But it was not until the 28th and 29th of November 1947, that Ajax hit the peak in entertainment. Yes, those were the days of the Engineers' Ball.

Weeks of intense preparation preceded the "break" from traditional Royal York Hotel functions to the Ajax Recreation Hall, and the time was well utilized. To list all those who worked towards the success of the Ball and give them justice, would be impossible. The entire Engineering Society executive were engaged in one manner or another. Special credit is due to Bill Walker, President, Hal Blakley, Director of Publicity and Publications, Dave Davis, President 5T0, Bob Oxland, Second Vice, and those members of the Ajax Staff and Faculty who showed so much grand co-operation.

In two nights approximately 2,200 people availed themselves of special trains, busses and private cars to reach Ajax and dance to Bert Niosi in the Recreation Hall.

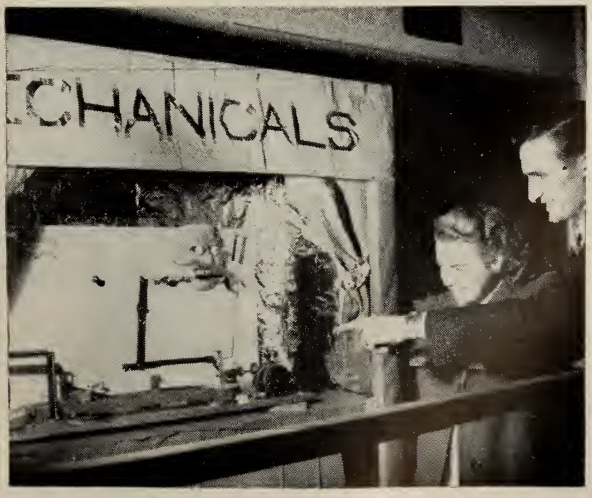
ENGINEER'S BALL COMMITTEE

Back Row: Left to Right: H. G. Joy; E. D. Knight; D. A. McCammon; G. R. W. Partridge; R. T. Richardson; W. P. Smith; J. R. Gregory; J. E. Morgan; E. D. Fedryk; E. G. McAndrews

Centre: H. B. Davis; R. C. Oxland; G. A. McDowell; W. W. Walker; Marie Critelli; H. W. Blakely; W. M. Rayner

Front: A. J. Markham; J. A. Couse; A. J. P. LaPrairie; D. Roseborough; D. C. Longman; J. C. Cameron

The theme of the Ball was the Engineers' search throughout the ages for something new. The first night of the dance, an engineer finally "discovered it" with considerable explosive violence—and Miss Canada—Margaret Marshall, appeared before all in a wonderful "New Look" ensemble. The second night saw Miss "Dusty" Henderson—Canada's top model, do a similar routine which set the crowd agog for several minutes.



THE "LACKSPEED CANCELLATION"

There were so many things—the eight murals—comprising 707 square feet of picture, the false ceiling, the crystal ball, the story of the Engineers' search through the ages for that "something new", the barbershoppe quartette, the gay nineties "coke" bar, the club displays, Joe Murphy, and all the rest.

Silent committees were everywhere working in perfect harmony to keep the greatest dance Ajax has had running as smooth as silk.

Coffee parties were scheduled throughout the evening in the various residences, to make intermission a memorable event in itself.

Perhaps it is no wonder that Bert Niosi was heard to say, "This is one of the four best dances I can remember in my last 10 years of playing."

Committees in Toronto and Ajax worked hand in glove this year to make the Annual School Nite, the best possible show and dance on the campus. As a result, Ajax took a very active part in all School Nite activities. Of the even dozen Ajax thespians associated with the show, ten of these were treading the boards of Hart House for the edification of eight different audiences who had the courage to buffet audience participation gags in Hart House Theatre.

And while histrionics went on in Hart House Theatre, dancers by the hundred indulged in terpsichorean revelry through the remainder of Hart House catacombs, until the last dog was hung.

Yes, it was a great year for all concerned. The thanks, bouquets and thorns, if any, should be given to your past Engineering Society representatives. They are the ones who carried the various tasks and tried to please you.

GARTH A. MCDOWELL

Ajax Aeronautical Club

THE Ajax Aeronautical Club was a small group this year; just slightly over one hundred students being enrolled in both years.

The Club executive was formed at an organization meeting held early in October, at which plans were discussed for the coming year.

Meetings were held in the Music Room of Hart House Ajax, and were followed by refreshments after adjournment. Speakers well-known in the Aeronautical profession were invited to speak on different aspects of the field.

In February, the Club, over one hundred strong, visited the plant of A. V. Roe, Canada, at Malton. A very fine tour had been arranged by the officials of the company, showing the members the research and testings labs, the "Chinook" jet-turbine, and a fullscale mock-up of the new jet transport, as well as the production layout of the company.

At the Engineer's Ball, that fine exhibit, "The Lackspeed Cancellation," created by Mitchell, Hawkshaw, and Doc Stonehill provided many laughs, and was of such calibre that the Decorations Committee of the School-at-Home requested that it be shown at the Royal York on the night of the At-Home.

Through the interest of Mr. B. Etkin, many club members were enrolled as student members of the Institute of Aeronautical Sciences. The ranks of the Association of Professional Engineers were also swelled by a good percentage of the club.

Thanks are to be extended to Jack McAvoy, Norm Forbes, and Brem Murray for their work on the executive during the year.

Best wishes are extended to the incoming Engineering Society and Aero Club.

J. E. MORAN

A Report on the Activities of the Civil Club Ajax Branch 1947-48

HERE we are looking back on a year's activity, though it seems yesterday we were beginning to look forward to this. And so the sharp realization that once more the exams are upon us and here we are burning the night oil (hair oil—to have on electricity here at Ajax) writing lab reports wondering hopefully what third year feels like.

After the inaugural meeting of the Club, there was held a grand smoker which was most enthusiastically attended.

The spirit of co-operation was certainly felt during the period of planning and preparation for the extremely successful Engineer's Ball. The part played by some of the stalwarts of the Civil Club is commendable, and the ball could not have achieved its degree of success without their support.

Mr. W. Tate of the T.T.C. visited Ajax and, in the Music Room of Hart House, he gave a most interesting talk on Transportation Engineering, basing his lecture on the T.T.C. He outlined the administration organization of this vast commission, stressing the part played by the Engineer.

Professor T. R. Loudon very kindly came out one evening and outlined the history and growth of Civil Engineering. He gave a stimulating description of the type of work that would be required in the various branches of Civil Engineering. The meeting was then thrown open to a rather vigorous and enthusiastic question and answer period. After the meeting was adjourned, the boys were able to return home with probably a more soul inspiring outlook for the future.

And this weekend comes the final meeting, to ring down the curtain on another year on this vast campus. We are anticipating a most enjoyable banquet to be held in the Genosha Hotel, Oshawa, when Professor Morrison will address the gathering.

And so in closing, I would like to congratulate the executive on the whole-hearted support they gave towards making the Club run smoothly. There were many small and some large jobs too, which required a great deal of time, and about which most people never hear.

Best wishes to next year's executive.

G. R. W. PARTRIDGE.

Ajax Electrical Club

THE initial activities of the Electrical Club for the 1947-48 session commenced with an October meeting, to elect the remaining members of the club's executive. Those elected were the Vice-Chairman, Dave Coates, and the Sec.-Treasurer, Joe Hockins. At this meeting, the Club Constitution was presented, followed by an outline of the general purpose of the Club. During the succeeding week, the Group representatives were nominated and elected by their respective classes.

In due time, a stag to end all stags was arranged. (It is interesting to note that it was a Toronto Club that finally achieved this worthy aim.) It was held early in November at the Glen Eagles Hotel, a most successful and enjoyable party, the usual Skule Spirit prevailing.

The final meeting of the first term competed with the Christmas exams for popularity; however, there was a very fine response. Mr. C. W. Baker, Chief Engineer of the English Electric Company, addressed a very large and appreciative audience of Club members on the topic of Electronics in Music, illustrating his lecture with lantern slides.

The Club Executive, in the second term, assumed the occupation of clothiers. Club cardigans had been proposed, leading to the formation of a sweater committee. After numerous meetings had been called, a design was agreed upon, soon to appear on the campus. Electrical Club crests have already been presented, gratis, to every member of the 5T0 & 5T1 Electrical course. A final meeting, at which sound, technicolor, motion pictures of the Hydro Development in the Far North and Electronics in Industry were shown, rounded out a very active year for the Electricals.

Before I close, I would like to draw attention to the important part that the Electrical Club members played in arranging the spot lights and illumination at the Engineer's Ball.

I would like to take this opportunity to thank my Vice-Chairman and Sec.-Treasurer, and all the group representatives who put the Electrical Club on top, for their fine co-operation and support.

To the incoming Electrical Club Executive, I should like to offer my sincerest wishes for a very successful year. Good luck!

J. C. CAMERON

Ajax Industrial Chemistry Club

In keeping with the atomic developments of the modern world, this has been an explosively successful year for the Ajax Industrial Chemistry Club.

Early in the year came a request from the Engineering Society. They were planning a little effort known as the "Engineers' Ball" and the Club was called upon, along with all the others, for their support and astute insight. The full story then began to come forth. It seemed that someone at Skule had realized that all through the past millennia man had been unsuccessfully searching for something, he knew not what. The Ajax engineers were going to undertake the monumental task of unravelling this mystery and presenting the world with their findings. The Chemicals task was now plain. They were to smooth out the "bugs" that kept the last barrier from being surmounted.

What better way to shake out a solution than the atom bomb. The Ajax atom bomb was prepared for them (what has Los Alamos got that Ajax hasn't—we have lots of wide open spaces too!)

The result of the search is now common knowledge. Having seen the "New Look", it is felt that it should be blown to . . . the place from which it obviously came!

A number of speakers from the industrial field made the necessary safari and brought to the Club various interesting and worthwhile thoughts from the outside world.

The Club was quite pleased to note that a little party held in Toronto was free from explosions (and repercussions). Did we hear a Toronto club voicing envy?

The other Club excursion to Toronto was to attend a joint meeting with the Chemical Institute of Canada. One of the members of the Ajax Club delivered an exceptionally fine address. Thanks, Bill Hook, for so capably representing us at that meeting.

All courses at Ajax were invited to the final meeting of the year, and were enthralled by Dr. Misener's lecture and demonstration on liquid air. Quite appropriately he terminated his lecture, and the Club's year, with a BANG!

D. A. McCammon,
Chairman.

Ajax Mechanical Club

In spite of ponderous time tables, Mechanicals at Ajax had a relatively active year. 560 men strong, and as many dollars rich, we laid the foundations for a series of club affairs at our inaugural meeting October 7th—corner stone, (and just as heavy) Mr. "Ack Ack" Walter, Secretary-treasurer; breast work (he'd done a lot of it) Mr. Al Gabany Vice-Chairman, Class reps. included Don Smeaton, Bill Morash, Leno Crema, Paul Lewis, George Campion, Ed Raftis.

After much nefarious negotiation a bang-up smoker was staged, by popular request, at Glen Eagles Manor. There, some 250 Mechanicals saw the end of a prodigious quantity of refreshments and a riotous show entitled "The last of the Terpsichoreans"—which, of course it turned out to be—thanks to Caput.

On November 24th, Professor Allcut arrived accompanied by Profs. Jones, McIntosh, Smith, Wiren, and Lord to provide an informative and inspiring evening in the Music Room of Hart House.

The December meeting was foregone in favour of the Engineer's Ball. At that historic event, Mechanicals, in a display of Skule Spirit rarely equalled on this campus, came up with the new famous Goldbergian Gadget, "Morning Routine for Toike McOike."

"Mechanics hear Iceman," quipped the Varsity after our Jan. meeting when we enjoyed an address presented by Mr. Gordon McKiver of Can. Ice Machine Co.—Mechanics indeed! And we learned a hell-dammner method of cooling those 560x40 beers too!

Probably the most dignified of all our dignified affairs was the Mechanicals Banquet on March the 1st., when we were honoured by the company of many distinguished guests. The Hon. W. Earl Rowe M.P., President of the Great Lakes Paper Co. was guest speaker. His fine talk followed a grand turkey dinner.

Interspersed among these events were six field trips to the G.M.C. Plant at Oshawa. Each class was provided with a tour at Club expense. Sweaters were acquired for first year men.

Many other lesser accomplishments could be listed but space limitations preclude their mention.

John Couse

Ajax Mining and Metallurgical Club

DURING the school year the Mining and Metallurgical Club enjoyed a full, interesting and educational programme. The activities ranged from artistic novelty dancers and beer at the Rouge Hill to a lecture on the Life, Love, Lure and Lore of Mining in British Guiana.

Out in front, as usual, the M and M was the first of the Clubs to have its annual smoker. Although the evening was well enjoyed and many tried for their forty per, it is recommended to the new executive that the next social event be held in an abandoned stope.

Along educational lines the Club sponsored guest speakers and movies covering such diverse subjects as Mining in Chile, Metallurgical Experiments, The Iron Deposits of Labrador, Mine Financing, Mining in British Guiana, and Prospecting in the Barren Lands.

In the way of entertainment at its meetings the Club sponsored the Glory Holers, The Rock Bugs, and the Grave Yard Shift Revue. It is worthy of note that there was a call for an encore after one of the performances.

The Club also served its members in a professional capacity. Registration as Student Members of The Ontario Association of Professional Engineers and The Canadian Institute of Mining and Metallurgy was made by class representatives. Through the Ontario Mining Association employment was obtained for students desiring underground experience and arrangements made for X-ray examinations in Toronto.

Representing student undergraduates interested in the Mining Industry, the Club Chairman addressed the Annual Convention of The Prospectors' and Developers' Association in Toronto.

The main event of the year was an evening at Ajax sponsored by the C.I.M.M. At this meeting, attended by the leaders of the industry, the Club was addressed on the subjects of undergraduate and graduate employment and opportunities.

Debates Club—Ajax

With the opening of the Atomic Age, Ajax Engineers will associate public speaking and Debates. This year for the first time in the history of Ajax, there existed an Engineering Society Debates Club. Each member came forth with a blast no less spectacular than the Bikini trials.

With Engineers, topics of discussion range from ones regarding the opposite sex to affairs of international importance. One can readily see that there are many combinations possible in the above range. On the occasion of the debate "Resolved that women be excluded from training in the professional courses of Law, Medicine and Engineering," a representative body from Ajax's Whitney Hall defended their interests. Other topics were "Resolved that engineering courses should adopt more cultural subjects on their curricula," "Resolved that national armaments ensure peace," and "Resolved that a university course should be more liberal than technical in nature." A panel discussion on Religion was held with Padre Carl Swan as guest speaker.

The officers of the club were E. D. Fedryk, chairman, F. W. Shepanski, Vice-chairman and D. E. Coates, Secretary-Treasurer.

5T0 EXECUTIVE

Class 5T0

Our two years of exile on the snowy steppes of Ajax have "had course" and by the time this is being read the Hegira back into civilization will be an accomplished fact. Thus 5T0, complete with slide rules and memories of the Ajax Division, arrive at the little Red Schoolhouse to continue the never-ending battle with the "demies".

The memories, both good and bad, will scarce vanish without a fight, and the years to come will find us looking back on the past two sessions with mixed feelings remembering a campus full of both character and characters. We will undoubtedly reflect that character for years to come in the very turbulence of our activity.

As for the characters, the joint was replete with them. Who could forget "Red" our canine comrade and chief foodtaster; Guiseppe and Bryerson with the girl whom they raised to immortality in Ajax Rumblings, yea, verily, she of the oft-dipped thumb on steam table three; the barbershop quartette composed of Jim Hartt, Hayman, Miller and Warren that won the valued "silver" mugs at the Election Dance; and the irrepressible Garth McDowell with "McDowell's Madcaps", composed of Mich McCloy, Matt MacLaughlin and Mike Stoyanoff, bringing down the house at Skule Nite.

No more will strident calls of "The bus is here" reverberate from the flimsy walls to summon reluctant rogues from their pits to try their terpsichorean talents on the Bell Belles in the common room. Ah, yes, an Ajax house party than which there is no whicher.

Our memories would be much amiss if we didn't call to mind some of the boys who were so active on the sports front; Bruce Cummings and Steve Karrys sparking the Blues in their tie with the mighty Mustangs; Cec Turcott pushing the puck around for the Senior Blues; Harry Wilson looking like a perambulatory telephone pole and Casey Latinovitch and Gregory dropping spheres through the hoop.

The highspot of the second term, the Soph Dance, will stand out as the first dance at which the crowd was just the right size for pleasant dancing, and with the gals bedecked in their heterochromatic evening gowns to brighten the scene, a wonderful time was had by all.

5T1 EXECUTIVE

It was a great year and only a promise of what is to come from 5T0 before we graduate in the "Crash" of '50. With this in mind I would like to thank the other members of the executive, Bert Jackson, Don Grant and Don Rae, for their fine help and co-operation, and extend to Bob Allen and his capable crew our best wishes for the greatest year yet.

H. B. Davis

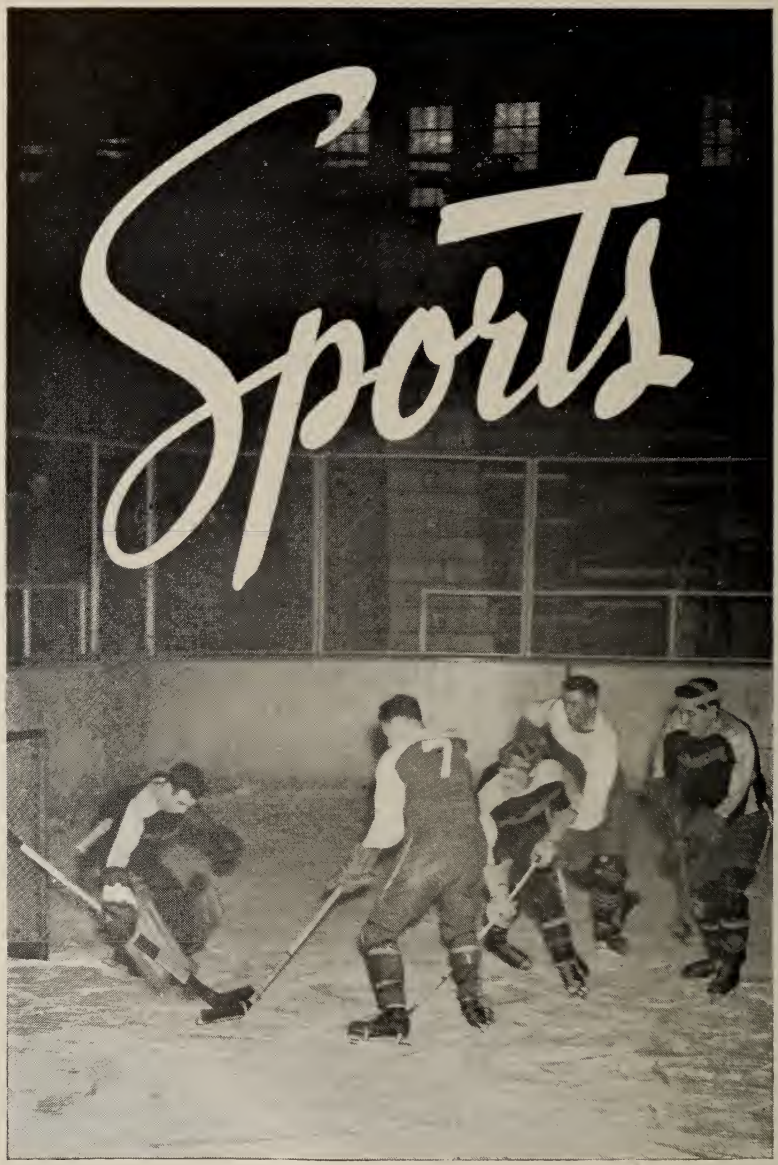
5T1

Once again a year of University life is drawing to a close. As far as the class of 5T1 is concerned it has been a definite success. Our athletic, scholastic and social achievements have reached a standard seldom attained. Needless to say, a good deal of the credit should go to our "elders"; the class of 5T0, who have, in a quiet and willing way, helped us over the rougher parts of the path. It remains true, however, that this would not have been possible were it not for the keen and energetic spirit so prevalent in ourselves. The interest and enthusiasm shown by the student body during the recent elections is an indication of their desire to take an active part in the affairs that will be ours to administer next year. Then it will be our job to organize such social occasions as the Engineer's Ball, our own Sophomore Dance, and to work in conjunction with Toronto on such celebrated affairs as School Nite, and the Skule-at-Home. I feel assured that the class of 5T1 will do their utmost to run the extra-curricular life of Ajax during the year 48-49 in as wise a way as we have enjoyed in this our freshman year. Surely we will make 5T1 a class long remembered in the history of Skule.

W. M. Raymer,
President 5T1.

THE END OF THE MOLE

MARGARET MARSHALL AT AJAX
MISS CANADA 1947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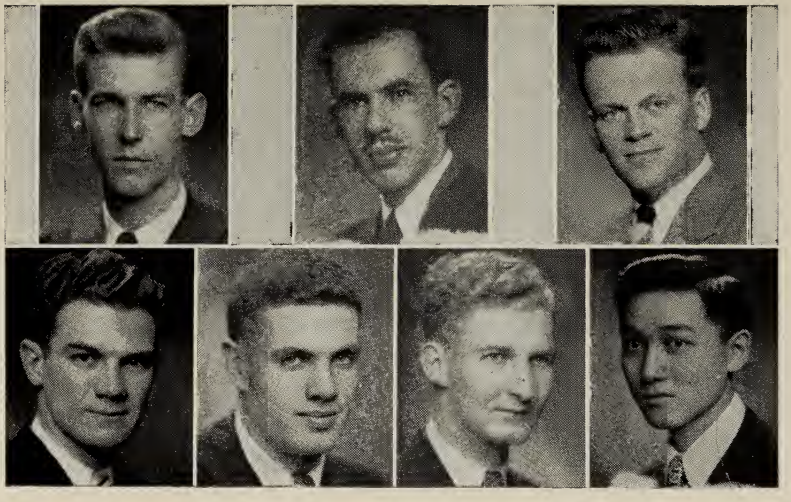


ATHLETIC EXECUTIVE

Top: J. A. Swan; T. W. C. Little; D. A. Bell
Bottom: R. Hall; W. McCann; E. Sokolowsky; Y. Shimizu

S.P.S. Athletic Association

SCHOOL this year has placed a good second in the race for the T.A. Reed trophy. Although winning only the hockey championship this year our teams have consistently made the play-offs in nearly every sport.

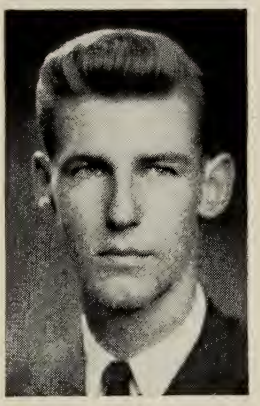
In this the third year of intercollegiate competition since the war, Varsity has fared much better than in either of the other two and to all those Engineers who have supplied a large part of the ability and fight to the various Blues teams we extend our congratulations. To the Schoolmen who fought so valiantly in the interfaculty lists and almost brought home the bacon we say "good show"! The team managers who worked so ably deserve a great deal of credit.

The new point system inaugurated last year has been slightly changed—we hope for the better—but we believe it is fulfilling its purpose of encouraging more participation in athletics and of raising the standard of awards.

Next year as well as being Varsity's year should also be School's especially with all the talent coming in from Ajax and so to Don Bell and the rest of next year's executive we wish the best of luck in what promises to be a hot year at School.

J. A. SWAN

Bronze S



J. A. SWAN

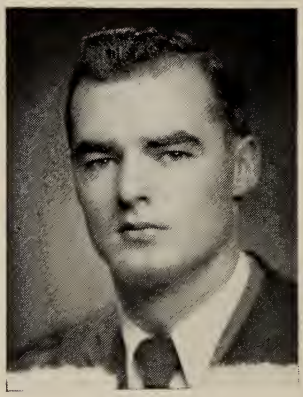
THE bronze S is awarded each year to the member of the graduating class who has shown outstanding ability in athletics, true sportsmanship and a keen interest in sports, during his four years at S.P.S. It is school's most honoured athletic trophy and the graduating class of 4T8 this year has awarded it to Jack Swan.

Jack's ability in athletics has been proven by his outstanding record with the senior blue basketball team. In his first year he played on the junior team and broke into the senior team in his sophomore year to stay with the team for his junior and senior years. Jack is one of those "dependable" players who never seem to have an "off day." In this last season, as coach Bob Masterson's ace centre, he was one of the top scorers on the varsity team.

In addition to playing for the blues, Jack was also active playing volleyball and coaching the senior school basketball team. His keen interest in sports has been unequalled during the last four years as he has served on the S.P.S. athletic association as secretary, vice-president and finally President in which position he was mainly responsible for School's high standing in the Reed Trophy race this year.

To Jack, School extends its heartiest congratulations and we know that by his record here, his success as an engineer is assured.

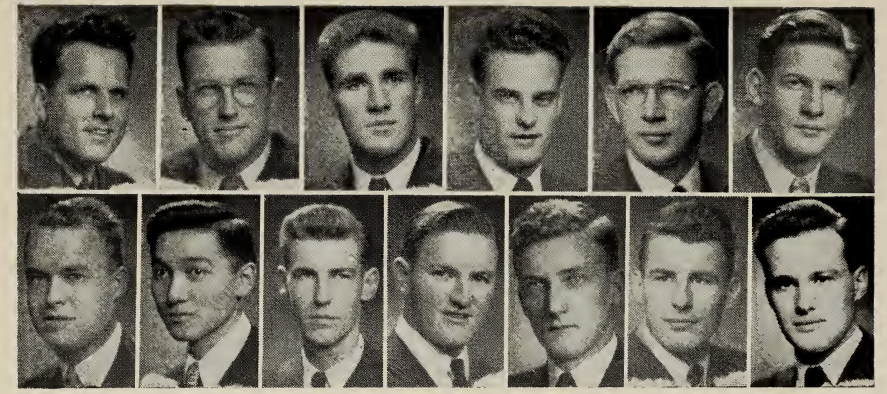
Phene Memorial



BILL NORD

THE Phene Memorial Trophy is presented each year to the man on the Senior School Rugby team who has, in the opinion of the other players on the team, displayed true quality of sportsmanship enthusiasm and team play to the best advantage. This year the trophy was won by Bill Nord and in choosing Bill to receive the award, the team echoed the opinion of all the rugby fans that followed School this season. Bill, a sixty minute man, always turned in a stellar performance with his tricky footwork at half, his impossible one hand pass receiving. Besides this, he was school's kicker and was a hard tackler on the defence. Bill first learned his football at Riverdale Collegiate and was on the team that won the city championship in '43. On coming to School he turned out for Rugby and made the Jr. School team in his first and second year, graduating to the senior team in his senior years.

Although football seems to have been his main interest Bill also found time to distinguish himself in hockey, track, volleyball and skiing. So to a real athlete and a regular guy, all S.P.S. extend congratulations and a sincere wish that his engineering future will be as successful as his athletc life was here at S.P.S.



SPECIAL AWARD BRONZE S

Top: Left to Right: D. P. Crichton; J. Grierson; E. Granfield; H. Johnston; W. MacDonald; J. McReynolds

Bottom: R. Spence; Y. Shimizu; J. A. Swan; H. Thompson; P. Turnbull; G. Wallace; D. Fleet

Special Award Bronze S

THE little Bronze S is a new trophy given for special achievement in athletics. It is awarded for participation in both intercollegiate and interfaculty sports during the four years at School and hence cannot be claimed until the final year. The point requirement is set at a high level, about three times the number required for a felt letter; so that the special award is a coveted and hard earned distinction. This year twelve men became eligible for the special award.

Dave Crichton —Varsity track and harrier for two years, School hockey champs, School football.

Don Fleet —Swimming and waterpolo for Varsity and School champs.

Ted Granfield —Varsity Senior Swim team four years, School waterpolo, rugby and hockey.

Harry Johnson —Two years Varsity hockey, School hockey champs. School volleyball and swimming.

Bill MacDonald —Varsity swimming, Varsity hockey manager for two years, School swimming, waterpolo, rugby and hockey.

Jack McReynolds—Three years Varsity football, one year Varsity basketball, School basketball and rugby.

Jim Grierson —Two years Varsity football, one year Varsity track, School basketball and hockey.

Yon Shimizu —Two years Varsity basketball, School basketball, soccer and volleyball.

Bob Spence —Four years Varsity golf team, three years School hockey.

Hugh Thompson —Four years Varsity soccer, School basketball.

Pete Turnbull —Three years Varsity swimming, School swimming and waterpolo.

Gord Wallace —Four years Varsity basketball.

SENIOR FOOTBALL

Standing: Left to Right: D. Ferguson; T. Brownless; R. Powell; G. Kay; S. Heslip; J. Thompson; P. McDevitt; E. Odette; G. McCreery; T. Coates; R. Kidd; J. Gibson

Kneeling: R. Stephenson; F. Seivert; D. Trist; W. Nord; Bob Nelson; B. Gilbert; F. Godfrey; W. MacDonald; B. Love

Sr. School Football

SR SKULE got off to a bad start this year, dropping their first five games. However the boys got their clue bags on and ended up the season with a recisive win over Ajax (13-10). It wasn't as bad as it sounds, though; the team lost three of those games 1-0. "Tiger" MacDonald played at centre and was steady throughout. Sam Heslip was outstanding at inside and Bob Short, a real fighter went well until an injured shoulder put him on the sidelines. Johnny Wilson and Ross Kidd, two large chaps, were most effective defensively, even though Ross had a hard time keeping those shell pants on. Ed Coates deserves an all-star slot for his performance at middle, (and should go up and play for the Blues next year.) The ankle snatchers at outside, Bruce Gilbert and Fred Sievert, rounded out the front wall quite well. (Both boys tackled hard and caught their share of the passes.) Remember Gilbert's "running" commentary on a downfield

kick at Ajax. The line alternates, Murray Leggee, Russ Stephenson, Jim Thompson, Phil Wade, Ted Brownless and Bob Love kept their end up well and their efforts were commendable on several occasions.

Jack Triste and Ed Odette alternated at Quarterback. Jack played steady ball all season and his spirit was of the best. Ed's most notable efforts were in the forward passing department accounting for large gains and a couple of touch-downs. Don Frances at flying wing was quite effective in the blocking division, (his defensive work at centre secondary was a highlight.) Nelson, McCreery, and Kay looked after the plunging duties and put in some great games. Pete McDevitt was used sparingly at flying wing but played a brilliant defensive game against Ajax at the end of the schedule. (Bud Powell managed to get into the last few games at half and from his drive and ability it was unfortunate that an injury kept him out of the earlier games.) Bill Nord who won the Phene Memorial Trophy this year was probably the best offensive man on the team. Bill's broken field running and pass snatching was a treat to watch and he well deserved the trophy.

(Thanks are due to Don Ferguson and Joe Gibson for their conscientious coaching effort. These boys spend a lot of time on the team.

To finish this effort, I may say that we had an enjoyable season, because everybody seemed to get a kick out of playing the game even though the score board may indicate otherwise.

Frank Godfrey,
Playing Manager.

SENIOR LACROSSE

Back Row: Left to Right: Jim Ellwood, Mgr.; Harry Howe; Len Watkins; Frank Jannaway; Tommy Schkordoff
Front Row: Bob Smith; Ed Kellman; Ken Anderson
Absent: Martin Olsen.

Senior School Lacrosse

THIS year Sr. School moved into Group I where they vied for honours with Senior U.C., Senior Meds and PHE I. After a slow start the team began to roll and was able to capture a play-off spot by virtue of a third place position in the top group. They then overpowered Senior U.C. in a playoff game to squeeze into the quarter-finals.

The first play-off game was against St. Mikes I. The Irish played a great game, forcing an overtime period, but succumbed to the powerful School team who turned on the heat in the final canto to win 10-7. Next semi-finals and PHE's muscle-men. After two postponements, the game was played with School losing out 10-5. It was a case of conditioning with School fading badly after leading 5-3 at the half.

The boys really deserve credit for their fight and the power they turned on and if it had not been for their slow start and the misfortune of illnesses at the end they might easily have copped the honours. Most of the team will be back next year and with this year's experience will bear watching.

The team this year was—Ed Kellman, Len Watkins, Tommy Schkordoff, Marty Olsen, Frank Jannaway, Bob Smith, Harry Howe, and Ken Anderson.

S.P.S. LACROSSE TEAM II

Back Row: Left to Right: J. A. Ellwood; Schacter; J. R. Fydell; J. H. Thorne; W. R. Ball; P. A. Fellowes

Front Row: C. Eland; G. R. Beach; H. Shugg; A. P. Sentance; W. M. Metcalfe

School Seconds—Lacrosse

This team was placed in a group this year along with Forestry, Dentistry and Meds II. There was no better team in the group but mathematics kept them out of the playoffs by a single point. School had three wins, two ties and one loss while Forestry, the group winners, had four wins, one tie and one loss.

The School Seconds were really a scrappy outfit and anything they may have lacked in polish they made up for in try. The experience they gained will be a big help to them next year when most of the boys will be back there trying again for School.

Those making up the team were: Harvie Shugg, Al Sentance, Bob Beach, Pete Fellows, Ross Ball, Jim Thorne, Gord Schacter, Jim Eland, Williams, John Fydell, Murray Metcalfe.

To next year's players and managers for School lacrosse the best of luck and my appreciation to this year's squad for their co-operation.

Jim Ellwood

S.P.S. SENIOR SOCCER

Back Row: Left to Right: B. C. Teale; J. L. Haines; J. Morgenstern; R. R. Hibbard J. A. Walker; A. H. Meyers; W. K. Redsell

Front Row: E. E. Martyn; R. L. Westell; R. E. Murphy; Y. Shimizu, (Mgr.); A. Grice

Absent: K. A. Oakley; B. Yamamoto

Soccer

THIS year, School thought that with the great number of Engineers coming in from Ajax, there was a good possibility of having 2 teams from Toronto in Interfaculty competition.

However, at the first two practices before the opening of the season, the turn-outs were so poor that it looked like grim days ahead for the Senior School Soccer team. It took two games in which we were defeated, before we found a combination that looked good, had lots of fight and could score the odd goal. From this point on, the squad took on new vigor and finished the season without further losses, to end up in second place in their group. They advanced to the quarter-finals against Trinity, and in a game played on a wet and muddy field in cold rain, they lost to end all hopes for a championship this year. It was a tough way to go out after the terrific fight and spirit they showed to end up in second place. Half of them will be graduating this year, but that still leaves a good nucleus around which to form a club. Senior School ought to go places next year.

Y. SHIMIZU

S.P.S. HOCKEY III

Back Row: Left to Right: Ross Ball; D. R. Diebel; Harry Johnston, (coach); Jim Grierson; Bill MacDonald

Front Row: Paul Phillips; W. O. C. Miller; Joe Durant; Al Sentance

Absent: E. L. Littlejohn; Harry Black; J. A. Robbins; Gord Johnston; Bill McCann

III S.P.S. Hockey

GLANCING over the powerful roster of this squad, it is difficult to realize just what happened in their endeavour to cop the coveted Jennings cup. Joe Durrant in the cage turned in many a fine effort. The defense of Jim Grierson, Bill MacDonald, Jake Robbins, Bob Diebbel and Little John acted the stone wall to all who came near. On the attack we had Greek Phillips, Harry Black and Al Sentance, on one line, with Ross Ball, Chris Miller and Gord Johnston forming the other. Bill McCann was brought up when Gord Johnston suffered a broken wrist.

The boys started slowly, tieing the first two games with Vic and Dents but losing to Forestry.

The second round proved more successful. First a win over Victoria and then the crucial game with Dents—a win would have cinched the group. The boys started the game grim and determined. Although having the best of the play they found themselves short 4 counters at the game's end.

In the last game they chopped down Forestry, putting them out of the running. Maybe next year- - - -

SAILOR JOHNSTON

Back Row: Left to Right: J. McCreedy, (coach); A. P. Sentance; M. P. Murphy; R. C. Short; G. R. Muddiman; R. M. Veenis; R. T. D. Graham

Front Row: G. H. Sedgley; W. J. Crocker; R. E. Fortin; W. D. Sutherland; B. W. Gilbert; A. MacDonald; E. N. Lye

Sr. S.P.S. Hockey

"That Jennings Cup, you know, means the best hockey team in the biggest intramural League in the world and across the page are the guys who won it. What d'ya say, fellows, doesn't that make us world champions of some variety?—the Leafs, the R.C.A.F. Flyers and Sr. S.P.S. You know another two weeks like that last and we could even take on the first two teams on that list.

The season saw scheduled games and four play-off type go by with but one loss, and each game as it was won was really won—remember the first out at Ajax, we'll swear it was 20 below,—that 2-1 win over U.C., that was close, but for a real fine shave, who can forget the "do" with P.H.E.—what a performance.

You chaps all know who played how and who hit them hardest but you can't help mention things like those goals of Nick's—one a game for sure, gad, they were pretty. Dick did all right too in that sense, and always right there for that rebound—just like Johnny said. Someone asked if you ever get mad, Dick, with that grin of yours? Bruce and that shot bears a mention for certain—the old right hand top corner—seems to me Gerry had trouble with one goalie who knew where that corner was; couldn't have been much trouble though, cause Sedge was the team's top scorer. I don't imagine a defenceman ever played harder than Dave in those finals, more Medsmen iced—of course, Mud was teamed with Dave and more than once caught that centre who figured roving in the centre zone was a clever move. We won't mention PHE—that was before Johnny told the defencemen how. Remember Russ and that big boy in Pharmacy, penalty-killer Fortin yes, but giant-killer yet—there's more? Murph had quite a time, too, in that game, handing out some terrific bumps then winking 'watch the next one' back to the bench. At times we thought Suds was playing defence too, with his sallies to the blueline, but you guys add up the goals against him—only 2.3 per game and but 9 past him in the play-offs which represents about .009% of the shots on goal 'cause things were pretty tough a few times out there you'll recall. Shorty really let a few guys know he was around didn't he; including a couple of referees—damn shame those penalties, clean checks, every one.

When someone was beat (which was often) Johnny came out with 'go on out Crock," and out went more trouble for the opposition. Yeh, Crock was one of the guys who didn't "make" the Srs. at first, but from the hockey he played you can see what a chore it was deciding just who would. Let's hope it's as hard a job next year, too and for sure the old cup will stay where it belongs.

Al Sentance

S.P.S. HOCKEY TEAM II

Back Row: Left to Right: Bill Nord, Mgr.; Roy Steed; G. R. Pamplin; W. A. O'Neil; Jim Schultz; Bern Wiacek

Front Row: W. R. Stepkowsky; Bill Crocket; Bill Tranmer; Howie Shugg; John Walker; Dave Crichton

It was just an off day! That's all we can say about losing 6-2 to Sr. Med's in the playoffs. Since the start of the season the whole team had been shaping up very well—just a little better than the other teams of Group III. This is shown by the record of only one loss and a tie to P.H.E. and Trinity I. The team was made up of two battling lines and a stonewall defence. Up forward were Dave Crichton, Bill Tramner and Bill Crocker. Alternating with this line were John Walker, Berne Wiacek and Jimmy Schultz. Stopping Trinity I, P.H.E. or Pre-Meds inside the blue line were Ray Steed, Gib Pamplin, Walt Stepkowsky and "Windy" O'Neill. And stopping that little black disc between the pipes was our formidable Howie Shugg. All the fellows played clean hockey and not many sat out 2 minutes on the other side of the ice.

We came close this year but don't shed too many tears. Most of the team will still be around next year, so let's see you take that Jennings Cup in '49 gang.

Roses (if he likes them!) to Al ("Faithful") Sentance who was always on hand to help at *every* Skule game.

Bill Nord

SCHOOL IV HOCKEY

Back Row: Left to Right: G. R. Muddiman, Mgr.; D. B. Hislop; A. E. Weichel; Earl McDonald; G. V. Bull; Harry Hill

Front Row: Gus Brace; B. W. Harper; D. W. Whelan; W. H. Nord; Bob Galpin

Absent: E. G. Odette; J. Ratcliffe

School IV Hockey

"HELL" said the boys when they dropped their first two games, and went on the rampage against Meds downing the docs 7-0. Feeling their oats they went in the playoffs without a loss. In the playoffs they gained a smashing victory over Dents but were edged out by Jr. Vic and a 2-1 score.

The scoring punch was supplied at first by the little dynamite line of Harper, Brace and Nord until the big dynamite line of Hislop, McDonald and Ratcliffe hit its stride and began scoring its share of the goals. Bob Galpin as alternate forward showed real fighting spirit. Weichel and Hill, Bull and Odette on defence turned in stellar performances. A big star goes to Doug Whalen for his terrific game in the nets."Got no tape" Sentance deserves thanks for his loyal aid behind the bench.

We may not have won the championship but we held up our end for school, had some fun doing it and that's what counts.

MUD

Back Row: Left to Right: Jack Swan; Stew Bate; Mac McClenehan; Don McLaren; Jim Grierson; Al Warwick
Front Row: Jack McReynolds; Bud Fitch; Rod White; Paul Phillips; Joe Meschino
Absent: Red Torrens

Sr. School Basketball

HERE'S the team that almost did it. Sweeping through the regular season with but one small loss they entered the play-offs with vigour and determination. Edging out PHE II by one point they came up against the senior aggregation from the same place and went down by six points. And with those six points went their hopes for the Sifton Cup.

But it's no wonder this team was such a threat. With McReynolds, Grierson and Bates in control of the rebounds at both ends, Meschino's shooting accuracy, Fitch's hook shoot, Phillips' speed, and the inspired defensive play of McLaren, McClenelaus and White this team was one to be reckoned with.

J. SWAN

S.P.S. II BASKETBALL

Back Row: Left to Right: Bill Stowe; Sandy McGaw; Shonk; John McCarthy
Front Row: Y. Shimizu; Fletcher; Bruce McHenry; Erling
Absent: C. Derek; S. Bate; D. Marshall; Webster

THE Seconds had an imposing array of talent this year, consisting of a nucleus from the "amazing School Fifths" of 1945-46 and some men from last year's Interfaculty Champs Ajax I. However, the fellows just couldn't get started in the season winning games, and dropped their first 4 encounters. However, in the last 2 scheduled games, they justified my optimistic faith in them by trouncing a Jr. School B. team, and defeating the league leading St. Mike's A. team. The way they rolled in the last two games, makes me wish there was another round of games, which would probably have seen them make the playoffs. The team, consisting of Fletcher, Erling, Shonk, McGaw, McCarthy, Marshall, McHenry, Stowe, D. Bate, and Webster, fought hard for School, and I want to wish them the best of luck in basketball next year.

SHIMIZU

Back Row: Left to Right: A. B. McClaren; Bill Bell; Bob Harris; Murray Oster
Front Row: Alex McPhail; Art Foster; Paul Mills
Absent: John Roe; Chick Jageilnik; Bud Fitch

After losing the first three games by very tight margins to Vic, Forestry and Trinity, we finally clicked to take the next three games. It was well done—considering the fact that none of the boys knew each other before the first game and had never played together previously.

Forestry, having been undefeated in their first four attempts, was the top team in the group when we met them the second time. But Billie (Sherman Tank) Bell managed to stop them cold with a few unseen but shuddering shoulder blocks while Ab McClaren and Swish Oster were hooping the ball. Chick Jageilnik took time off his job-hunting journeys to help Ron Foster carry the ball, in that nice-to-see win.

Alec McPhail played splendidly all season and kept the boys in there fighting—including Paul Mills who was one never to waste any energy but played well when he had it to waste. With Bob Harris the steadying factor in the team the squad was well rounded and showed remarkable improvement as the season rolled on.

Bud Fitch

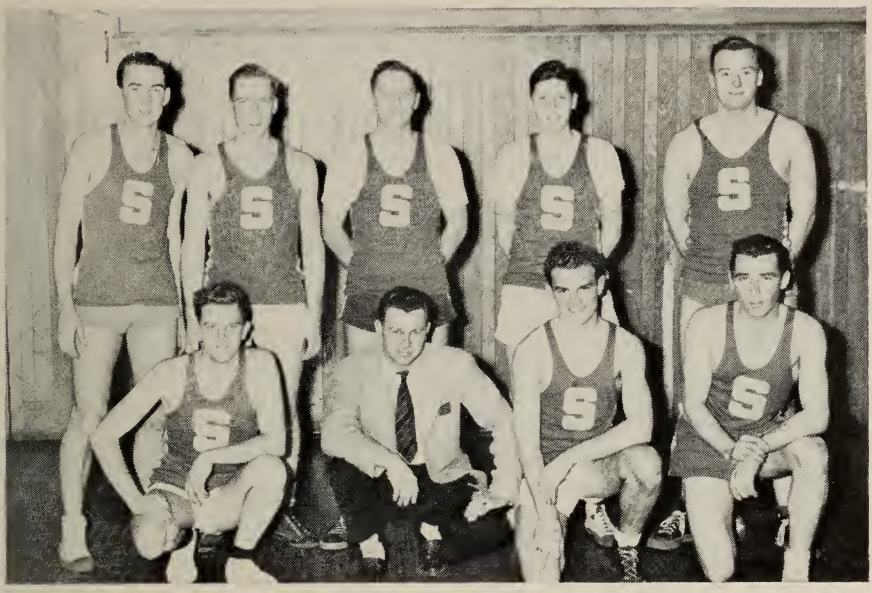
P.S. If anyone sees big John Roe tell him the schedule's over.

S.P.S. IV Basketball

All the Varsity had to say was the simple announcement that Pharmacy A's and S.P.S. IV would tangle in the first game of the season.

But to Schoolmen this small type statement packed a wallop. For this year's IV's wasn't just an ordinary team, since on its roster it carried names like McCreery, Halpenny, Watkins, Stepkowsky, Mark, Bryna, Guy, Cambpell Janaway and McNeill. Consequently the IV's served notice to all and sundry that afternoon when they trimmed the A's 46-14. The game was typical of all games played by the IV's—McCreery getting the ball on the first tip-off, whipping it to Stepanowsky who passed to Halpenny, who sank the basket with calculated ease. Such team play was typical of all the IV's efforts and how it brought in the points!

Dropping a couple of close ones to a hard fighting aggregation from St. Mike's was no disgrace but enough to end any hopes for the crown. For their solid sportsmanship and fine team spirit my compliments to every member.



Back Row: Left to Right: J. B. Elder; J. A. Morrison; Kileeg; David Bate; Lake
Front Row: Bob Black; Bruce McHenry; Ron Hall; Walt Emon
Absent: G. M. Desjardins

In basketball circles, its a fairly well known fact that in order to win a ball game, a team must score a reasonable percentage of the shots taken. Perhaps that is what led to the downfall of the fifths. If ever a team had hard luck around the basket, this one did. When not bothered by the "Gremlins", though, the boys were tough to stop, as the last two games of the season proved.

After four straight losses, they finally shook off the scoring jinx and came through with two convincing wins to round out the schedule.

Big guns of the team were; Lake and Godfrey at guard, Morrison and Hall forwards, and Kileeg at centre, but they had very capable support from such men as "Joe" Elder, Bate (the younger half), Emon, Desjardins, and Bob Black, who started late in the season but was a welcome addition to the squad.

Many thanks, fellows, for the great spirit displayed all season.

Bruce McHenry

S.P.S. Basketball VI

THE gods chuckled when School Sixes entered the big league, for had they not decreed that no even numbered team would win its group?

But just as if the team didn't know this they showed such drive that the gods were forced to intervene. To the casual observer this intervention went unnoticed; but to the team it manifested itself in the shots that wouldn't drop through the loop and in the fouls the referees persisted in calling wrong.

Foiling their plans on the forward line were the famous Ridgeway twins, Mickey Spears and Bern Teal, who with Don Francis accounted for most of the team's points. Alternating with these were Don "Dodo" Sanderson who could cuss the refs. in three languages, "Autoor" Gaye of longshot fame, and Bill Dimma, who "dazzled 'em with his footwork."

Jumping for rebounds around our basket were Rick "Pony" Punnett whose galloping confounded the opposition, Harry Ballantyne (Whaddaya mean I fouled him, he got up didn't he?), Bob Love, "Pass it to our boys Teehole", and Pete "Whatahookshot".

PETER MCDEVITT

S.P.S. I Volleyball

Well here they are—as fine a lot of men as ever smacked a volleyball over the net. And they lived up to their promise, too—well, almost. For reaching the first game of the play-offs they came up against an unknown team calling themselves Jr. Pre-Muds or Meds or something. Never heard of them myself—professionals maybe! Anyway our boys went down fighting valiantly. The scores? 13-15, 15-12, 14-15—just a point or two short.

But they played well and hard—every man jack of them—and what more can you say.

P. Phillips

Back Row: Left to Right: Bill McCann; Harry Rootham; Harry Johnston
Front Row: Don Bell; Dave Bate; Bob Tress
Absent: W. R. Stepkowsky

Volleyball S.P.S. II

THE Second's this year never quite seemed to reach winning form and consequently went down to five straight defeats before finally managing to win a game—the last of the season.

While not necessarily outclassed, it always ended up with the seconds on the wrong end of the scoring sheet. Possible Lady Luck was "agin" us, who knows.

Members of the team outstanding in their efforts were Bill McCann, Hib Hibbard, "Step" Stepkowsky.

Nice try, fellows and better luck next year.

DON BELL

III Volleyball III

The thirds this year were a fighting ball club composed of a few men from last year's squads plus some new recruits. Throughout the season we were outplayed by the other teams in the group which accounts for the fact that we didn't win a single game. However, the team showed lots of fight in all games and the opposition was extended on most occasions.

If any one man deserved special mention, it should be Ted Schacter. Any team composed of six Schacters would certainly win their loop. Bill Nord, "Mud" Muddiman, "Chuck" Yeates and Bob Galpin played good ball all season especially in the spiking department while "Rod" White, Chris Miller and "Corky" Kenyon played a steady game setting them up. Pete McDevitt was a late comer to the team and showed plenty of fight in the last few games. All other men on the squad played a good brand of volleyball during the entire season.

Despite the fact that no games were won the Thirds were a swell bunch to work with, and with a little more experience plus the fight they displayed would have gone far.

G. J. Thomson

Back Row: Left to Right: J. A. Cooper; W. R. Ball; O'Neill; Bill; Alex Duncan
Front Row: Nick Pappas; Bill McCann; Bill Edgerley; R. Hadley
Absent: Pete Fellowes

School IV Volleyball

THE School IV volleyball team, one of the most formidable aggregations to take to the courts this season, was outlucked in their quest for the trophy. This year, led by the excellent spiking of Alan Duncan and "Nick" Pappas, the club spurted to an early lead in their respective group but over confidence coupled with the odd "Alphonse and Gaston Act", engineered by "You take it" Hadley and "No, you take it" Cooper spoiled chances for a group win and the championship.

However undaunted by the unfortunate results, most of the boys will be back next year, judging by the amount of work they are doing, hoping to win the laurels which fortune and circumstance denied them.

W. J. McCANN,
Manager.

Back Row: Left to Right: D. A. Cameron; W. H. Chadwick; R. H. Brady; A. B. Donaldson
Front Row: J. B. Edler; W. A. Hills
Absent: W. Cole

Volleyball S.P.S.

"And the lastest shall be firstest"—can happen even in Skule. This year's No. V team consisted of Six electrically minded Schoolmen who volunteered to keep the tail end of the volleyball representation from hanging too low. Much to their surprise, the first game was a win and the anxiety of uncertainty changed to a spirit of confidence that gave them their initial momentum.

Stalwart like Bob 'Spike' Brady, Bill 'Pick 'em off the floor' Hills and Joe 'Set 'em up' Elder supported by Don Cameron—Bob Chadwick dragged their manager through the group without a loss.

At this point another electrical spark in the shape of Don Coles joined the crew to help offset the increased competition of group playoffs. Here was banished the U.C. 1sts. and Pharmacy 2nds. Meanwhile the other Skule teams had pulled a fade out and we were left to face the Ajax No. 1s alone for a position in the finals. This was our Waterloo, and Ajax truly deserved their victory. It is a good record and the team fully carried out the responsibility given them.

A. B. Donaldson,
Manager.

Back Row: Left to Right: F. Godfrey; G. R. Muddiman; P. Turnbull; W. A. Dimma
Front Row: T. Granfield; R. Anderson; J. R. Fydell; P. T. McDevitt; R. Tress, Mgr.
Absent: F. Samson, Captain

S.P.S. I Water Polo
Splash! Puff! Glub!

Such were the sounds that the opposing teams made when confronted with this power packed aggregation. Not that there wasn't the odd glug or even gurgle from our side because there wasn't.

They splashed their merry way through the schedule leaving a few half drowned Artsmen in the pool to mark their progress and ended up in the Schoolman's Hall of Fame—the hallowed pages of Transactions.

Both to those who will be returning to School and those who have to begin to work—good luck and thanks for your co-operation.

Bob Tress

Back Row: Left to Right: W. A. Dimma; D. Fleet; G. B. Conquergood; J. Scott; F. E. Punnett
Front Row: D. F. Jones; H. Chikofsky; W. Kyro; P. Fellowes W. Flanagan

S.P.S. Water Polo Seconds

S P.S. had a very successful turn-out in water-polo this year, and after a slight shifting back and forth, a well-balanced team was lined up.

The schedule was sprung without much warning, and after a shaky start, the team settled down into the win column, gaining a play-off position in Group 2. This fighting seven eliminated a strong Trinity team in the play-offs, 4-1, but was itself eliminated in the semi-finals by U.C. firsts, the team which went on to win the interfaculty championship.

Fred Punnett, playing his first and only year of water-polo, showed very well in the nets, stopping many sure goals. Defensive problems were solved by Gord Conquergood, Harry Rosewarn, and Pete Fellowes. Don Jones splashed a good game at rover, while Don Fleet, our welcome import from the Intercollegiate Blues, proved invaluable up front at centre. Herb Chikofsky played a fine game at forward, while Bill Dimma, at left forward, counted 15 goals, about half the team's total.

WALLY KYRO

Back Row: Left to Right: Bill Dimma; Murray Metcalfe; Don Campbell; John Dowsett; Jake Robbins
Front Row: K. Sanders; Bill Edgerley; C. L. Curry; Jules LaPrairie

S.P.S. Water-Polo Thirds

I was quaffiing a drink with some of the boys, a night or so ago, and the subject came around to Water-Polo.

"Water-Polo?" said I, "now there's a game upon which I look with great interest. In fact, I once managed the greatest water-polo team of all time."

"Olympic?" said one of the boys.

"No", said I, "School."

"Canadian Champions?" said he.

"No," said I, "They were defeated, as a matter of fact, in a group final of the U. of T. Intramural Championship. But it was plain those boys were improving so fast, that in another month, they would have been unbeatable. In goal, we used to play Don Campbell and Don Kempthorne. Not at the same time, of course, but even singly they were good enough for two. Les Curry, who came up from the Varsity Team, Jake Robbins, and John Dowsett did most of the scoring on that team. Murray Metcalfe and Ken Sanders used to back-check so well, our opponents often accused us of playing eight men, while Jules LaPrairie and Bill Edgerly were ambi-positionous, playing forward or defence, as the occasion demanded."

The boys moved away, incredulous, unbelieving. I doused another drink, and sat there in the darkness, alone.

BILL DIMMA

S.P.S. IV Waterloo

S.P.S. IV's., the only school waterpolo team undefeated in group play, were eliminated in the first round of the play offs by a highly rated P.H.E. team.

Largely responsible for this fine record was Jimmie "Junior" Crang, star of the Varsity Water Polo Team which, this year, captured the Intercollegiate and Junior Canadian Titles. Swimming centre, Jim assured our team of possession of the ball on almost every face off and accounted for most of the goals scored. Holding down the wing positions were Dave Milner and Dave Walker who contributed much to the team's success. Alternating at the rover position were Went Wheatley—"If you can't stop 'em, sink 'em!—Graham Lee Whiting and Gerry Steele, who showed a lot of fight and enthusiasm. The defence pair of Tom Parris and Jim Franks, one of the best defence duos of this year, made difficult the path to our goal. When the rival forwards who did pass the defence still had to beat Alec Duncan, whose long arms stopped shots that seemed sure goals.

Back Row: Left to Right: Fred Punnett; Bill Dimma; Chuck Yeates
Front Row: Gord Wilson; Harry Ballantyne; Bruce Williams
Absent: Mohun; Pollard; Lawrence; Duff

Track and Field

With the influx of peasants from down by the Lake Shore with their two years of running practice, School is on the verge of new successes in Track and Field.

This year to start the ball rolling, Mohun took the 100 yard dash and placed second in the 220. Gord Wilson did some sterling work in the 880 and the mile, while Limak gained a 2nd place in the 16 lb. shot. Shaw Lawrence and Pollard were men to be reckoned with in the hurdles and jumping.

With the practice those hungry Jaxmen from the wilds will get running after (or from) the wild young things on the Toronto campus School should be a sure thing in Track and Field next year. The grapevine says that the New Look has slowed them down though, so if we don't win we'll know what to blame.

H. Ballantyne

School Ski Team 1948

THIS is the Sr. S.P.S. Interfaculty team that we are writing about not to be confused with the Big Blue Intercollegiate team which also is made up almost entirely of engineers. Nor is it to be confused with that great team from Ajax which won the Interfaculty Championship for the second year in a row, leaving the Sr. S.P.S. team in second place.

Alf Hanson came through again to win the combined Total for the meet for the third year in a row taking second place in the jumping with the best distance of the day. Bill Armstrong and Russ Stephenson weren't far behind him with 4th and 5th place respectively. In the Downhill Bill Spence was best for the team with a fourth place. The other members of the team Jules La Prairie, Murray Jacobs, Lefty Morin and Al Sage, all contributed to the teams points.

Whether Ajax or Toronto, keep up the good work and don't lose that Ski Crown.

HUGH CONOVER

AJAX ATHLETIC ASSOCIATION

Second Row: W. Clark, (5T1 Representative); J. Platt, (Member at Large); W. Walker, (President Engineering Society); D. Grant, (5T0 Representative); T. Matsui, (Publicity); J. A. Markham, (Treasurer)

First Row: F. Horton, (Athletic Director); J. P. Green, (Vice-President); H. J. Wilson, (President); P. J. Dowling, (Secretary); Professor W. J. T. Wright

S.P.S. (Ajax) Athletic Association

THIS has been the third year of existence of Ajax as a branch of the University of Toronto. During this past year as in the two preceding years the "Jaxmen" have engraved a very enviable position in the record books. Their athletic prowess has made them one of the most feared names on the campus and although they have not won every championship they have overcome the great obstacle of distance and have given each sport a valiant try.

The Athletic Association has tried to provide the best in equipment and transportation for our teams. With the large scale inter-residence athletic programme everyone has a chance to compete in some branch of sport, be it inter-residence, inter-faculty or inter-collegiate.

The "Jaxmen" are handicapped in inter-collegiate circles due to the distance from the main campus. In spite of this they have upheld School in this branch of sports and we would like to congratulate them on their fine showing.

We would like to thank all those who have co-operated so willingly to make the tremendous Athletic Programme a success, with a special vote of thanks to two fine gentlemen namely: "Buff" Horton and "Pat" Sheehan, for the magnificent way in which they have promoted Ajax Athletics.

We wish the incoming executive the best of luck and hope they will receive the same kind co-operation that we have had.

In closing I would like to say: "Thanks A Million!" to my associates on the Athletic Executive and to all the fine fellows at Ajax. Your co-operation has been greatly appreciated.

H. J. WILSON

Ajax Athletic Nights

One indisputable fact can be said about the past year's Athletic Nights held monthly in the Recreation Hall; impossible as it may seem, they got bigger and better as the session wore on.

The first of the series was a fairly unpretentious affair, presenting as its main attraction the somewhat under-conditioned cream of the Ajax box-fight crop. An even dozen of these erstwhile Arthur Kings pleased the crowded auditorium greatly with lots of the old college try and a little blood-letting. Residence 729 was the proud recipient of the Dean Young Pennant for October.

Then in November the monthly entertainment feature began to show signs of assuming the proportions of a three-ring circus, with band, majorette et al. This Third Annual Football Forum featured the greatest aggregation of football brains (and lots of brawn, too) ever gathered under one roof. Every well-known coach of importance—Obeck, Masterson, Morris, Metras, Reeve, Coulter, Fox . . . . ad inf. and several star players—Krol, Doty, Masters and their ilk found their way to the stage to acquaint the "Jax" with the intimate secrets of big-time rugby in Canada. Residence W-6 took control of the pennant for the monthly athletic accomplishments with a record total.

Then in January the young Engineers' fancy turned lightly to thoughts of hockey as voiced by several modern greats. Many interesting opinions were voiced on Olympic choices and the inside doings of the pro hockey squads. A demonstration of the manly art of Defendo instilled the fear of the opposite sex into the breast of every budding young wolf present. Top event of the evening was a basketball game, in which the "A" squad vanquished the Western Colts 54-44. West 6 again copped the pennant.

On February 12th the last and possibly best Night featured such varied types of entertainment as figure skating, broomball hockey, a Hockey Forum wih several famous stars of the pro leagues, and last but not least the annual visit of the mirth-provoking Ten Old Men. Such all-time cage greats as "Screaming Willie" Rogin, "Scowlin'" Jess Fitton and "Eagle Eye" Bill Bodrug graced the smooth floors of our inconspicuous polydextrous edifice on King's Road and demonstrated the proper method of playing the game. Residence 731 took its place as proud possessors of the bunting for January.

First Row: J. C. Pavanel; Bill Mumford; F. Robinson; G. Smalley
Absent: T. K. Sweetman; D. B. Grant; D. N. Greey; G. E. Tubb; G. Canstable; S. Forrer; W. A. Easson; P. Knight; S. Scroggins; T. Tacium; Ian March; C. R. LeSeuer.

Ajax Golf

Most of the fellows on our Interfaculty Golf being of a modest nature did not show up for the team photograph (or they were lost in the Ajax snow).

During the two day Interfaculty Golf Tournament our men from Ajax brought a lot of credit to Skule. After the last weary foursome staggered up the eighteenth fairway at St. Andrew's Golf Club, the final scores were added with the aid of a flash light. We noticed that three of our teams had qualified for the tournament at the Summit Club to decide the University Golf Team. Our congratulations to J. C. Pavanel, D. B. Grant, and D. N. Greey and to the rest of the team—"nice try, fellows".

Third Row: R. Hammond; R. Marriott; J. Gordon; A. Lawrence; Ward G. Duff; A. Lawson; J. Jones.
Second Row: N. Firth; R. Hutcheson; R. Richards; J. Arnold; R. Hookings; R. Harbin; O'Grady; M. Chochinoff, (Coach)
First Row: Boorsook; G. Stepkowski; Cooper; Weaver; Scott; Brooks; J. Markham; J. Charosteki.
Absent: Rea; McClennan; Maunders.

Second Year Football Team

AJAX again produced a good team in its Second Year Football Team. Although only successful in winning one game the team showed lots of fight and should have won many more. However, after losing the first five games, generally in the first quarter the boys found out they did not have that thing called luck. The material was there and next year will prove itself when the team moves up to Senior School. These boys can't fail to click two years in a row and the Mulock Cup should be resting in the little red schoolhouse by the end of next season.

Paced by its backfield with galloping "Lick" Lawson, Roy Harbin, Jack Jones and Bert Hookings, the boys showed they could play a good game and carried the ball many times within scant yards of victory. Jack Jones and Bob Richardson showed up well on the defensive work. The play of Stu Scott was missed sorely after he had left to play for the Blues.

Next year, come out and watch these boys put Skule back in the running for the Mulock Cup.

"JACK"

Second Row: "Buff" Horton, (Coach); Frank Robinson, (Mgr.); H. Autterson; K. Henshaw; Ken Nevin; M. Connoley; Wes Williams, (Capt.); Norm Green; R. Patterson; John Follinsbee; O. Olynyk; Allan; J. M. Chissler.

First Row: O. Moulden; J. Boggs; Pete Phemister; Joe Orosy; P. Dowling; J. F. "Andy" Anderson; P. Valenti; E. Wray; F. Crandell; J. C. Platt; K. Dellenbach.

Absent: H. McArthur; P. Sephton; R. C. Monaghan; B. Peebles; J. Boston.

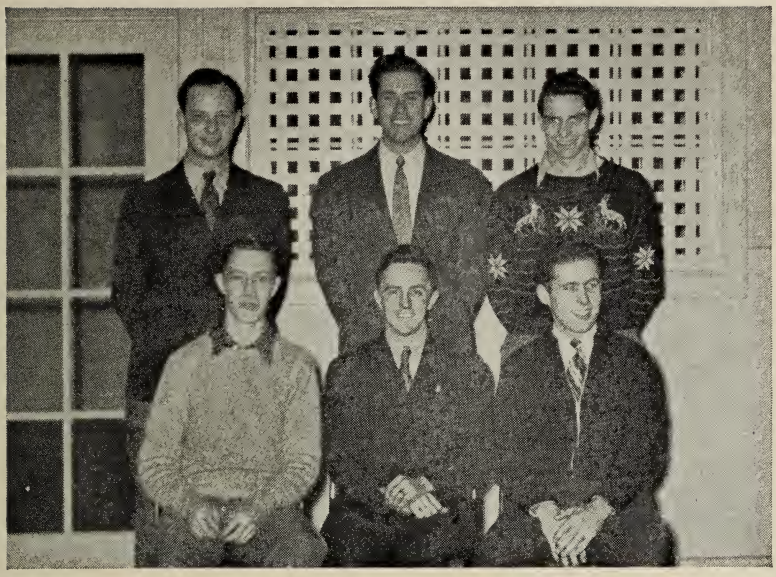
First Year Football

HERE we have the first winners of the Snowball Trophy. This new but already famous trophy was awarded to the First Year Football Team after they had decisively trounced the Second Year Football Team by the score of 1-0.

In the regular interfaculty schedule, we were less successful from the scoring viewpoint. Our only victory of the season was at the expense of our city brothers, Senior S.P.S. Nevertheless the team was always in there fighting in the best Skule Tradition.

Next year the team will play again as a unit and after the valuable training together this past year under coach "Buff" Horton, the other faculties better watch out for us.

"ROBY"



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First Row: T. H. Wilkins; C. A. Cover; B. Gray.
Absent: D. Washburn; D. A. Barr; W. Hunter; H. Tryhorn; G. Gobbins.

Interfaculty Harrier Teams—Ajax

THE Interfaculty Harrier team from Ajax had some very satisfactory success in the Frosh, Junior and Senior Harrier Meets in which it participated in the fall of 1947. The satisfaction came from the fact that a good many of the members were running their first competitive Harrier races. Enthusiasm and competitive spirit were high in all races.

In the Frosh Harrier the Ajax team managed to end up in second place with a good margin. In the Junior Harrier the complete team failed to appear on time and an incomplete team was entered. As the best runners were absent, the team only made sixth place or thereabouts. In the Senior Harrier the team managed to take third place and came very close to taking second instead.

Coaches for the Harrier teams were Dave Barr and Ken Nevin.

Outstanding members of the teams were: Bill Gray, Hugh Wilkins, Gervin Dobbins, Ron Hunter, Hugh Washington, Joe Washburn and Bert Cummings.

REG DARKE

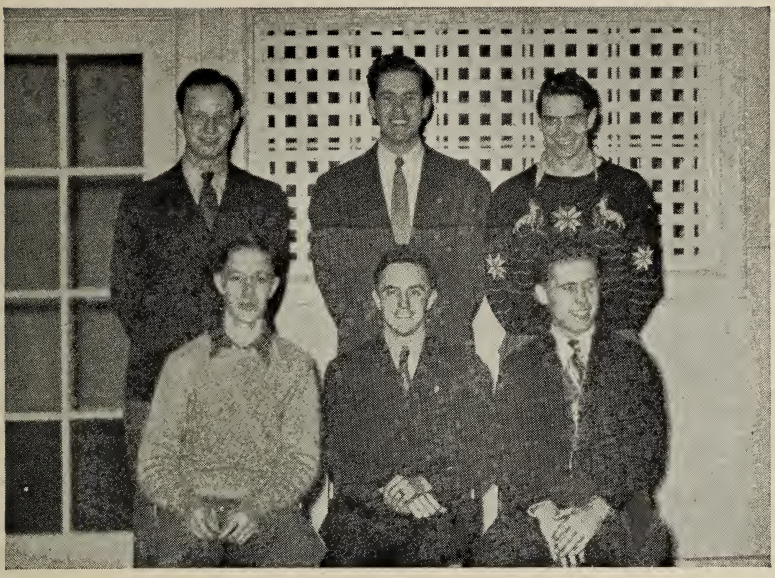
Third Row: D. L. King; D. R. Hollingbery; W. B. Maxwell; A. D. Cummings; N. W. Bethune; I. H. Wilkins.
Second Row: R. Darke, Manager; C. A. Cover; E. C. Marter; B. A. Warren; W. J. Hart.
First Row: B. Gray; W. G. Wigle; D. G. Schell; R. E. Boston; K. Nevin, Coach.
Absent: J. R. Adare; D. A. Barr.

Ajax Interfaculty Track Team

PLAY football or basketball for the Ajax Interfaculty team and you draw almost as much attention as the kitchen cutie who doles out the soup on the third steam table at Meatball Mansion. On the other hand, the stalwarts who follow the cinder paths and meet the challenges of the Queen's Park faculties, go unheralded.

Despite this inequitable popular support, there was much enthusiasm and speculation amongst the 42 track and field aspirants who turned out regularly to try for one of the 25 berths on the Ajax Track Team. Under the capable guidance of coaches Ken Nevin, Carl Marter, Bert Maxwell, Bob Adaire and Dane Barr, the team was selected and prepped for the three big meets of the fall semester.

In the first meet the junior blue and gold failed to retain the junior championship they had won the previous year; but, in admitting defeat to Victoria they were able to humble all other opposition and come up in place position. Ole Lady Luck was no better to Godiva's men in the Interfaculty Relays. As in the junior meet, the team was nosed out of first place by failing to come up with a winner in the last event. In the senior meet, the Jaxmen were satisfied in grabbing the third rung down from the top.



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First Row: E. Marshall; G. Takata; R. Buckland; R. Barki; D. Evans; D. Franco; L. Moffat.
Absent: N. Patterson.

The Ajax Soccer Squad

For the second year in a row the Ajax "A" Soccer Squad captured the Arts Cup. Throughout the season Trinity and Vic, the other two teams in the "A" group, could not defeat the team. In all, only five goals were scored on the squad during the season.

In the first round of the playoffs, Emmanuel brought out a well balanced squad and were leading 2-1 at half time, but in the second half as all through the season, the Jax boys came back with three fast goals to win 4-2. Trinity were our opponents in the final. The first half was scoreless and so was the second, leading to overtime. The checking and play was fast and furious for three five minute overtime periods, but Jax conditioning showed up in the fourth and final overtime period with Comrie potting the winning goal.

Standout performer was Jim Wotherspoon at centre forward, with able assistance from Ron Buckland, Vic Franco, Lang Moffat and Comrie. Thanks to a very strong half line of Ted Evans, Norm Patterson and Bob Glen, also fullbacks Mercer and Canzi, Barki in goal had an enviable record. George Takata, Bev Veale, Doug Campbell and Doug Marshall turned in stellar performances when called upon.

F. P. Juryn

Second Row: C. Murtagh; S. D. Woodruff; A. G. Turner; D. Cullingham; Manager.
First Row: J. N. Lurndry; I. Waxman; J. B. Prescott; B. Warren.
Absent: K. Delong; K. Thomas; B. Mainprize; B. J. Pilgrim; W. Malnychuck.

Ajax Lacrosse

Our Ajax Interfaculty Lacrosse team put up a very good fight this year but were unable to win a game from their better trained rivals. Lack of practice was the main reason for this at the first of the season, but in the latter part of the season it was poor luck that always gave us the short ends of very close scores.

Johnnie Prescott did a good job as playing coach in whipping an inexperienced team together. Barnie Warren and Ken Thomas amassed the largest number of goals, while Sammie Woodruff and Bruce Pilgrim got their share of points. "Jumpy" Waxman and his all-star sub Hank Bates did a lot of hard work in the nets behind two fighting protectors Red Lumley and Willy Malnychuck. Blondie Mainprize and Bill Farnell would have helped the team immensely had they been able to come out more often. Bruce Delong and Charlie Murtagh along with Al Turner and Bingham are four more very good causes for wonder at the unfortunate results of the season's play.

Don Cullingham

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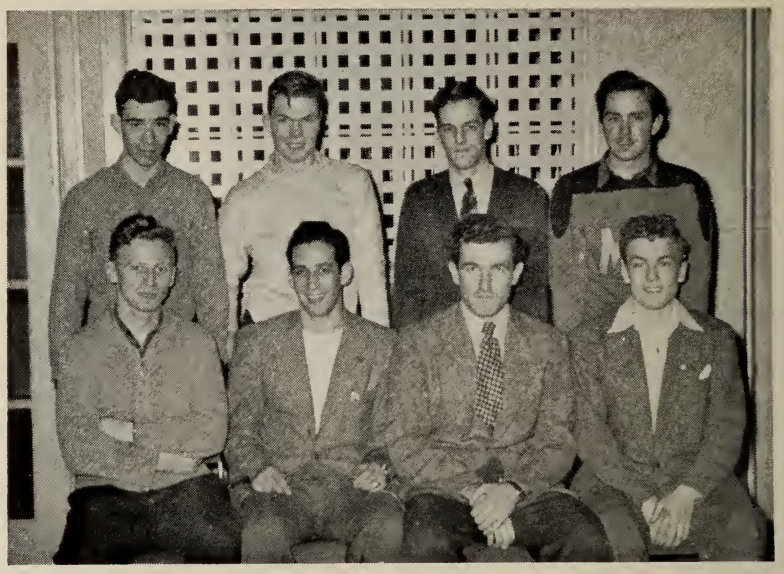

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Absent: W. R. Autterson.

Junior S.P.S. Ajax "A" Basketball Team

THE 1947-48 season saw the return of a major part of last year's interfaculty champs to the Ajax "A" lineup. With the addition of some fast stepping lads to fill the gaps, the team showed real championship form.

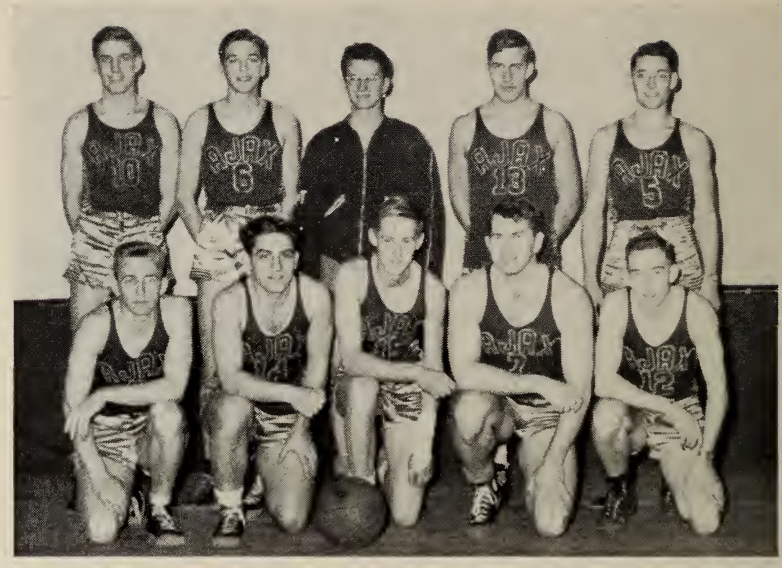
They were a slow starting aggregation, but once they got rolling they were masters of any situation. With the use of a very tight defense and a fast passing, fast running break they even humbled the highly touted Western Colts in an exhibition game.

In the first major interfaculty group their slow starting caused them to drop a game to Senior Vic and one to Junior U.C. However, their chief competition, P.H.E., tasted defeat twice at their hands. So Junior School went on into the playoffs.

The rest is history.

It was a hard fought, well played season. The whole team deserves a lot of cheers and Toike Oikes in their honour.

GEORGE SOULIS



Second Row: J. G. Buchanan; A. L. Braithwaite; W. Bebluk; N. D. Ham; W. H. Penhorwood.
First Row: W. G. Wigle; G. H. Stepkowsky; J. L. Neilson; H. R. Pickford; R. W. Clark.
Absent: W. J. McCagherty.

Ajax Junior S.P.S. "B" Basketball Team

ALTHOUGH they did not win the championship or break any high scoring records, the Ajax "B" interfaculty team completed a fairly successful season with a 1-5 record. The team played heads up ball at all times but their shooting finesse around the hoop was not up to par.

A good portion of the scoring plays centred around such cage stars as Bill McCagherty, Walt Wigle and the one and only Tiny Pickford. Sharing the defensive work were Neilson, Braithwaite, Penhorwood and Buchanan. Late starters, Clark and Stepkowsky came through with stellar performances when called upon.

BILL BEBLUK

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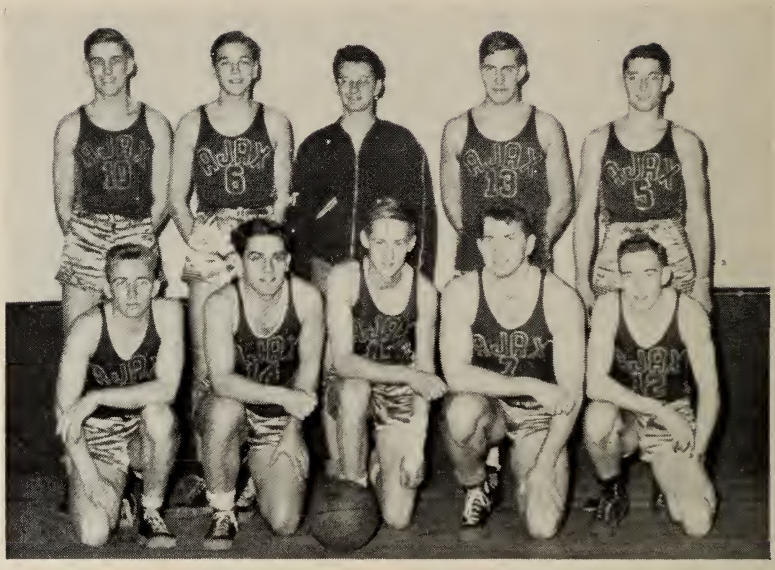

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Ajax "A" Volleyball

AJAX came through with flying colours this year to annex the inter-faculty volleyball championship.

As in any other sport, Ajax had to battle the powerful P.H.E. team for top honours in Group One. In the opening game of the season the team lost to the musclemen, but in the second meeting Ajax came from behind to down P.H.E. in a closely contested game.

In the playoffs, the Junior Skulemen downed Senior Skule and went on to meet again their arch rival P.H.E. The boys made no mistake this time and won decisively. The team met a stubborn Junior Meds team in the finals and after a very closely contested game, came out as victors.

Oustanding on the team was the setting up plays by "Red" Peebles and Leo Temkin which "Casey" Latinovich, "Lick" Lawson and Julie Hanson rammed down the opponents' throats. Bill Penhorwood, Tom Matsui and Hersh Fogel also helped out.

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Absent: J. Air; R. MacKnight; K. McKay; H. Sawatzky; A. Cunningham; H. Bates.

Ajax Interfaculty Hockey Team

THE Ajax Interfaculty Hockey Team began the season in championship form trouncing Sr. U.C. and Sr. Vic. in the first two games. However, their big brothers from Sr. School intervened, chalking up two consecutive victories in a style that bewildered the peasants. The icy wilds of Ajax witnessed three of the league games.

Coaching of the team fell on the experienced shoulders of Johnny McCreedy. Bruce "Ozark Ike" Cummings, a constant threat to break up any rush, strengthened the defence with Bob Hookings, Bob Patterson and Jack Jones from 1946-47 Jennings Cup Winners. The speedy trio of Zanatta, Crema and Cunningham appeared capable of performing anything while on the ice, but alas, the puck resisted all efforts aimed to place it into the mesh. John Follinsbee displayed great skill in the nets replacing Hank Bates who transferred to the T.I.L. If space would permit one could, quite easily, rave on about each member of the team including Don Sawyer, Fred Dyer, Bob MacFarlane, Bob Bertram, John Air, "Mac" MacKnight, Tom Crandell, Ken McKay, Hank Sawatzky and Don Grant.

JIM SINCLAIR

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JIM SINCLAIR

J. C. Follinsbee; J. Kirkup; H. Maisoneuve; N. Greene.

Ajax Boxing & Wrestling

WINNING three Senior Interfaculty titles out of four class finalists, Ajax upheld their fine reputation in boxing and wrestling during the 1946-47 season.

Led by Norm Greene who easily outpointed his St. Mike's opponent in the 147 lb. division, Ajax scored two more decisive victories when John Follinsbee and Rod McLennan captured the 165 lb. and heavyweight division crowns. McLennan had to battle twice on the final evening before annexing his honors.

In the wrestling championships Ajax had but one entry—Jack Kirkup in the 145 lb. division—and Jack did himself proud by bringing back to Ajax its first wrestling title.

Notable mention should be made of McHardy, Jackson and Maisoneuve, who gave good accounts of themselves in the earlier bouts. McHardy reached the finals in the 155 lb. class, losing a very close decision in the final.

Second Row: E. Powell; P. Christensen; D. Hughson; J. Holmboe
First Row: O. Michaelsen; H. Bakke; R. Barber.

Ajax Skiing

SKIING at Ajax this year was afforded more interest than in previous years, partly due to the keen desire of Ajaxers to retain their Interfaculty Ski Crown of last year and to the good weather conditions during the early part of the year, plus the active work of Harold Bakke, Bob Hutcheson and yours truly.

Early in the year these three organized the inter-residence ski meet which was held at Newmarket on a cold and icy day. The cross country was easily won by Bakke, who then followed up with a first in the downhill and a first in the slalom. Hut 731 was an easy winner in the meet.

We picked from the top places in the inter-residence meet eight men to represent Ajax in the Interfaculty meet and a very fine team they made. Ajax was an easy winner and much of the credit for this must go to our Norwegian tribe who dominated the cross country and the jumping, while the slalom and downhill addicts placed among the best to add more points to the glorious aggregate.

Some of us will pass on to the Toronto campus next year to ski for good old S.P.S. However, I am sure that our best wishes will go to Ajax for their continued success as interfaculty ski champs for the duration of Ajax time.

TED POWELL

Second Row: F. E. Horton, Manager; J. Motyer; W. Penhorwood; T. C. Arnold.
First Row: W. J. Brigham; J. Maunder; W. Tarasick.

Ajax Swimming

Led by Chris. Arnold who gave an outstanding performance in the 50 yds. free style event, Ajax swimmers went down battling before several well conditioned teams in the Interfaculty Swimming Meet held at Hart House, Toronto.

Handicapped by lack of training facilities (the only tank available, being the Ajax bathtubs) the men from Ajax were quite willing, but condition proved their downfall. Nevertheless, Arnold, Brigham, Maunder, Tarasick, Motyer and Penhorwood gave their best in a losing battle.

Association of Professional Engineers 1

Babcock-Wilcox & Goldie-McCullough 8
Burlington Steel Co. 9

Canada Cement Co., Ltd. 18
Canadian Bank of Commerce 216
Canadian General Electric Co. 209
Canadian Johns-Mannville 212
Canadian Liquid Air 214
Canadian Pacific Railway ..... *Inside Back Cover*
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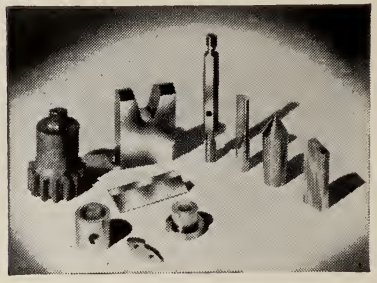
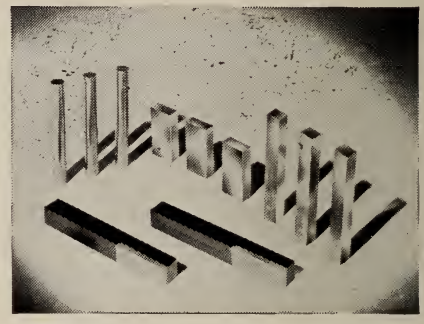
"DELORO STELLITE" has been known for over thirty years as an economical and efficient cutting tool. It retains its hardness at red heat and cuts long after high speed steel is burnt up. It has greater toughness and edge strength than cemented carbides. It pays to STANDARDIZE ON "DELORO STELLITE 100" cutting tools.





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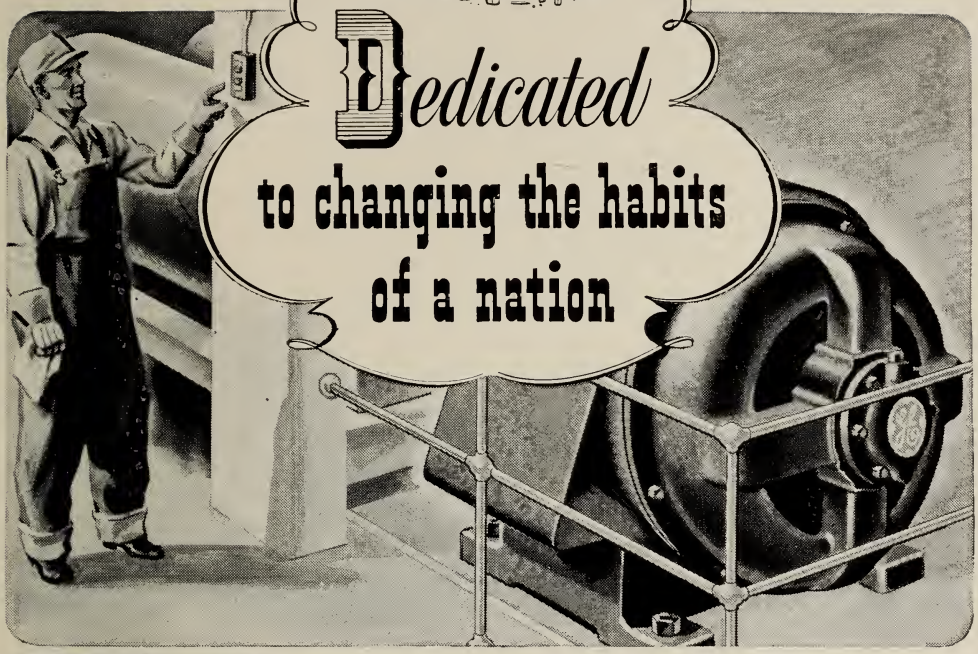
Among the many products supplied in "DELORO STELLITE" are:

Countersinks and Counterbores, Battery manufacturing components, Insert Milling Cutter Blades, Wheel Boring Cutters, Gauges, Woodworking Tools, Nozzles, Hot Forging Dies, Wear Strips, Circular Slitters, Work Rest Blades, Milling Cutters, Drill Jig Bushings, Shear Blades, Cams and Feed Fingers, Form Tools Valves and Valve Seats, End Mills, Lathe and Grinder Centres, Reamers, Thread, Twine and Wire Guides, Pump and Bearing Shafts and Sleeves, Metal Spinning and Burnishing Tools, Punches and Dies for Blanking, drawing and forming.

DELORO SMELTING & REFINING CO. LIMITED

DELORO ONTARIO

Dedicated to changing the habits of a nation



Trolley Coaches — Canadians' favourite transit vehicles—use G-E motors units and controls.

The high efficiency of electric lighting is typified by this modern G-E fluorescent installation.

Electricity helps Canadians to live better. This modern G-E kitchen saves time and work.

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FIFTY YEARS — a day in the life of a nation — yet the progress achieved in the generation, distribution and application of electricity during the past fifty years has made possible the standard of living we enjoy today. In this, Canadian General Electric has played an active and important part and is continuing to bring more and more of the benefits of electricity to more and more people . . . to change for the better, the habits of a nation.

CANADIAN GENERAL ELECTRIC CO. LIMITED

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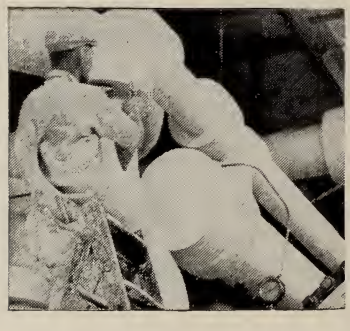
FROM J-M ASBESTOS...

. . . cost-cutting materials to help you reduce overhead



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For more than 89 years Johns-Manville has been manufacturing and developing a wide range of Industrial Insulations. Today there's a J-M Insulation Material for every temperature range—every service condition. Result: from the J-M group you can pick the insulation that is exactly suited to your particular needs! All these J-M Insulations are made to maintain high insulating efficiency through the years.

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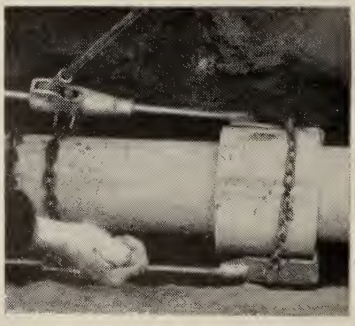

J-M TRANSITE* ASBESTOS PIPE

This asbestos-cement pipe can't rot, rust or tuberculate. It is impervious to acids, fumes and corrosive soils. Light and easy to handle . . . speedily assembled . . . has a high flow capacity. Johns-Manville makes special Transite Pipe for sewers, water-lines, flues, venting and other industrial uses.

*Trade Mark Reg'd.

Other J-M products include Insulating Brick and Insulating Fire Brick for temperatures up to 2600 degrees F.; a wide range of Refractory Cements, Transite Asbestos-Cement Sheets, Electrical Conduit, Asbestos Ebony Panel Boards, Building Materials and many other products for Industry. For full details and free catalogue write:

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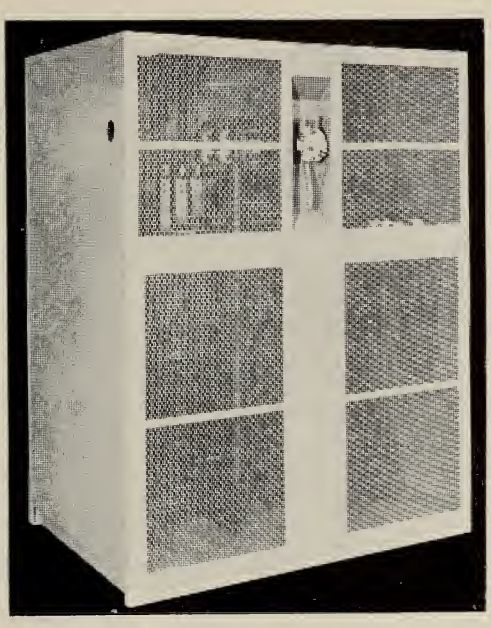

Illustrated is a 450 KVA, dry type Transformer

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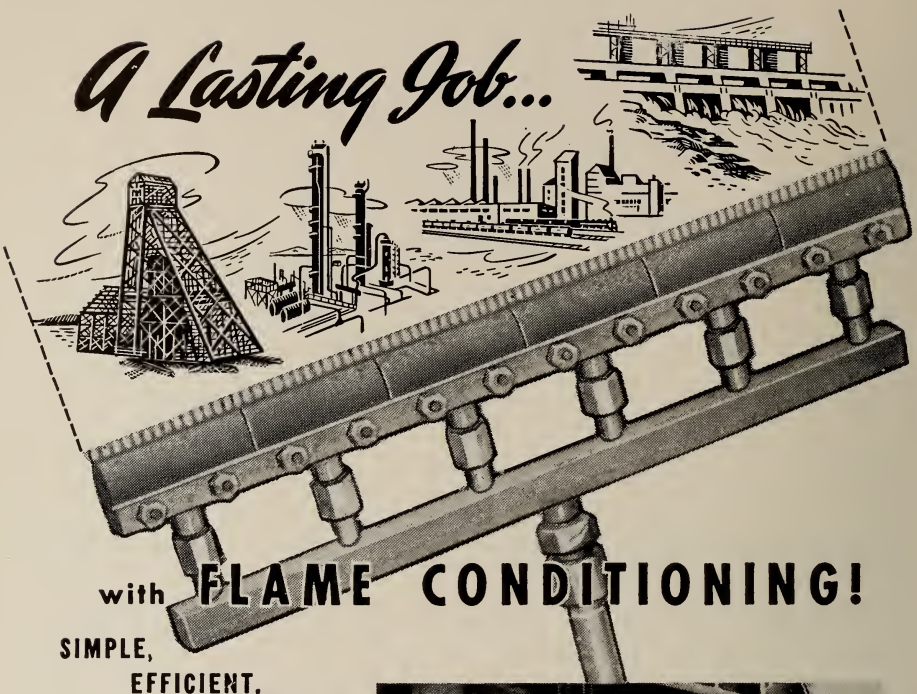
A Lasting Job...



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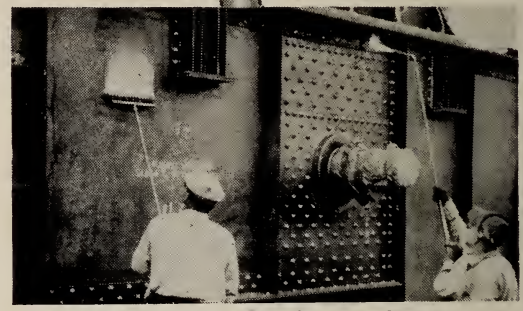
Intense oxyacetylene flames remove old paint, dirt and rust, explode loose scale, scabs and blisters and drive out moisture. Result is a thoroughly clean, dry surface for perfect bonding of paint, ensuring longer lasting protection. Equipment is standard, portable and flexible.



Paint Burning and Surface Conditioning

The flat surfaces are treated with standard stock flat tips which provide a row of small brushlike flames in close formation. Eight to fifteen linear feet per minute is possible with such tips. For corners, rivet heads, fittings and other projections a standard round tip is used.

The operation is simplicity itself, involving merely the use of the oxyacetylene torch and a wire brush to remove the debris.

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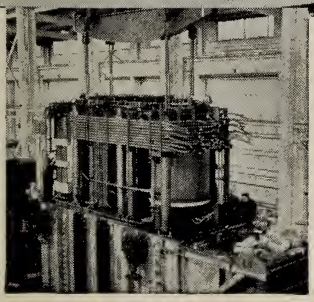

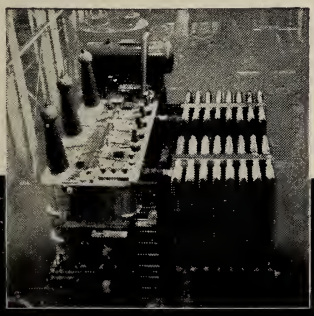

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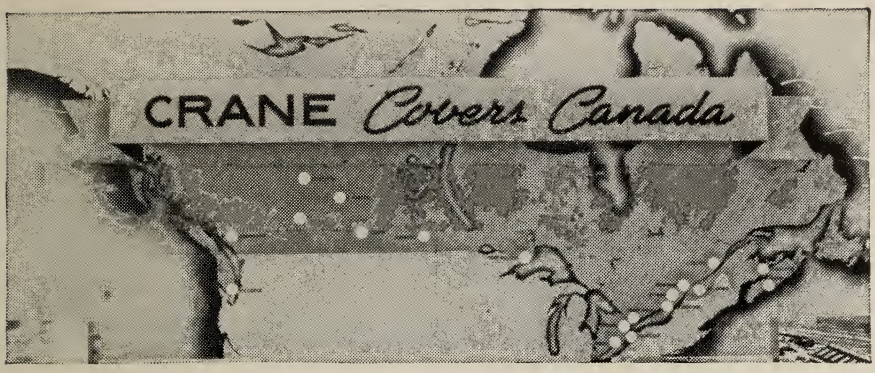

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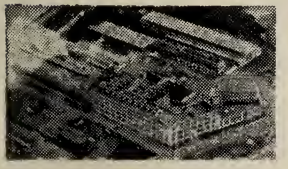

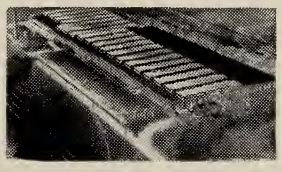
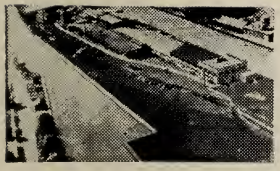
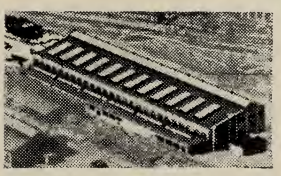
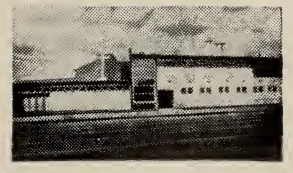

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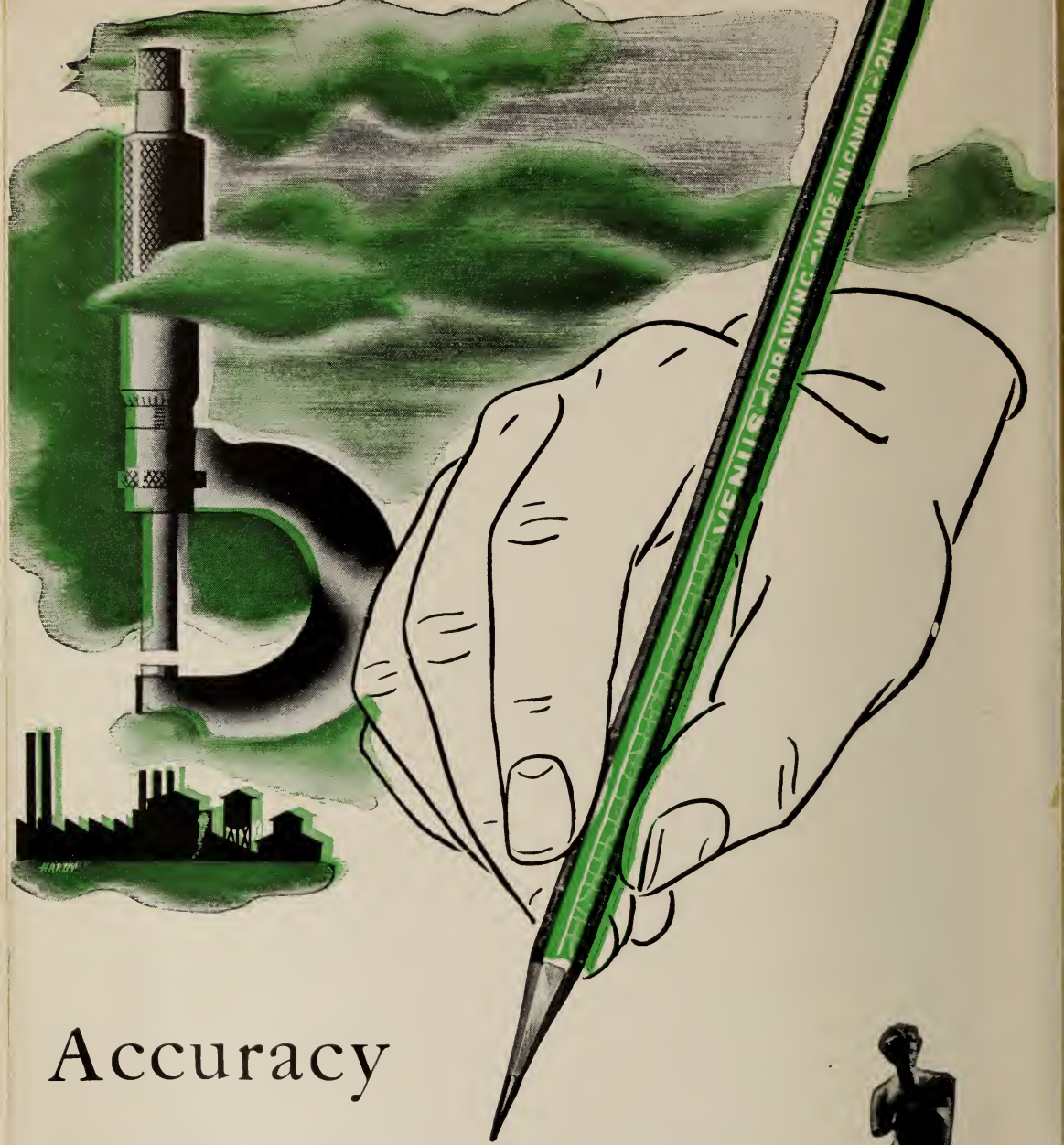

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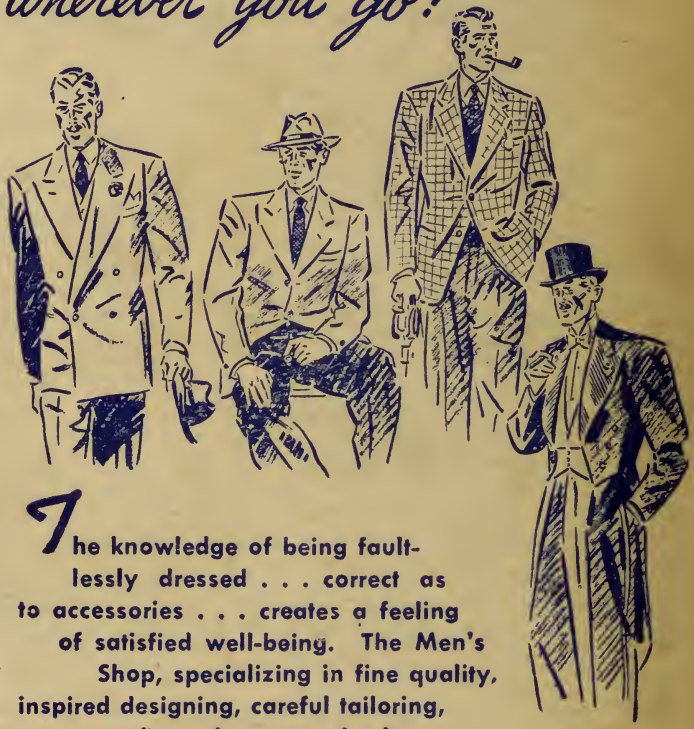

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